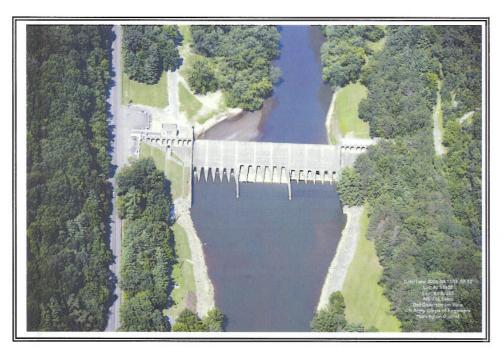
Dover Dam Dam Safety Assurance (DSA) Project Dover, Ohio



Phase I HTRW Environmental Site Assessment

U.S. Army Corps of Engineers
Huntington District
Environmental and Remediation Section
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Acronym List

AST Aboveground Storage Tank

ASTM American Society for Testing and Materials

CELRH EC-CE Environmental and Remediation Section of the Huntington

District, United States Army Corps of Engineers

CERCLIS Comprehensive Environmental Response Compensation and

Liability Information System

EDR Environmental Data Resources

EM Engineering Manual

EPCRA Emergency Planning and Community Right to Know Act

ER Engineering Regulations

ERGO Environmental Review Guide for Operations ERNS Emergency Response Notification System

ESA Environmental Site Assessment

FIFRA Federal Insecticide, Fungicide and Rodenticide Act

FINDS Facility Index System

HTRW Hazardous, Toxic, and Radioactive Waste

NPL National Priorities List QCP Quality Control Plan

RCRIS-LQG Resource Conservation and Recovery Information System – Large

Quantity Generators

RCRIS-SQG Resource Conservation and Recovery Information System – Small

Quantity Generators

RCRIS-TSD Resource Conservation and Recovery Information System –

Treatment, Storage and Disposal Facilities

SHWS State Hazardous Waste Sites SSHP Site Safety and Health Plan

SWF/LF Solid Waste Facility/Landfill Facilities
TCLP Toxicity Characteristic Leaching Procedure

TSCA Toxic Substances Control Act

USACE United States Army Corps of Engineers

UST Underground Storage Tank

Executive Summary

The Environmental and Remediation Section of the Huntington District, United States Army Corps of Engineers (CELRH EC-CE) conducted a Phase I Hazardous, Toxic, and Radioactive Waste (HTRW) Environmental Site Assessment (ESA) on the proposed Contract Work Limits (CWL) of the Dover Dam Safety Assurance (DSA) Project. Dover Dam is located approximately 3.5 miles north of Dover, Tuscarawas County, Ohio adjacent to State Route 800. (The exact location of the proposed Contract Work Limits is outlined in Attachment 1, and the general location of the area under investigation has been circled on the current Dover, OH USGS topographical map also located in Attachment 1.) Under the proposed DSA Project, the existing Dover Dam would be anchored to bedrock to prevent the dam from sliding during dangerously high water events. The proposed project would decrease the opportunity for the dam to fail in a critical flood event. The purpose of this Phase I HTRW ESA is to identify environmental conditions and to identify the potential presence of HTRW contamination located in the project's CWL. The investigation was performed in accordance with ASTM E-1527-00 and 1528-00 Standards, U.S. Army Corps of Engineers (USACE) HTRW policies and CELRH ISO 9001 requirements.

Investigative Procedures

A site visit to the Dover Dam DSA CWL was conducted on October 31, 2006. During the site visit, the ground surface was physically inspected and examined for signs of contamination which include stained soil, stressed or discolored vegetation, surface debris, underground storage tank (UST) fill caps or vent lines, unusual formations or depressions in the ground, and monitoring wells. The site investigation also included assessment of adjacent properties for potential contamination. Photographs of all potential contamination concerns on the subject tracts and adjoining properties were taken during the site inspections and are located in Attachment 6.

Sixty-year title ownership histories for properties within the CWL that are not under USACE ownership were researched in the Tuscarawas County Courthouse, located in New Philadelphia, Ohio. In instances where properties within the CWL were owned by the USACE, Real Estate files located in the Huntington, West Virginia District Office were researched. Property ownership histories for all tracts were developed in accordance with ASTM E 1527 and 1528 Standards. The sixty-year deed research was performed in order to determine past and present ownerships and usage of each property. Sixty-year title ownership histories for tracts not under USACE ownership can be located in Attachment 2.

Interviews were conducted with Dover Dam and Muskingum Area personnel to obtain specific information about past activities and current conditions on properties located within the CWL. Interviews with state and local officials were also conducted to determine if any potential HTRW

concerns exist on the target tracts or adjacent tracts. Interview information concerning this tract can be located in Attachment 6.

Records of regulatory agencies listing recognized environmental conditions in connection with the properties were accessed through Environmental Data Resources (EDR), a commercial database retrieval company located in Milford, Connecticut. (Database results from EDR may be found in Attachment 3.) Aerial photographs and historic Fire Insurance Maps were not available for the area; however, the current and historical USGS 7.5-minute topographic maps were obtained and reviewed. Current and historical topographic maps were used to identify current usages of land that could possibly indicate HTRW contamination. Both current and historical USGS topographic maps are located in Attachment 1.

Investigative Findings & Recommendations

A Phase I HTRW Environmental Site Assessment was performed on properties located within the proposed Dover Dam DSA CWL in Dover, Ohio in accordance with ASTM Standards 1527-00 and 1528-00.

Based on the research and site visit conducted as part of this ESA there are several environmental and/or HTRW concerns that would impact the proposed activities on the property. The following recommendations are given concerning areas within the proposed CWL associated with this project.

- During the site visit it was noted that USACE personnel at Dover apply (or have applied) dredged material to an area near both the left and right hand descending streambank above the dam to decant the water from the material prior to disposal. It is recommended that soil samples be taken of the dredge material and soil underneath the dredge material. This recommendation is made to ensure that no HTRW or other contamination is present in the dredge material that has been applied to these areas.
- Due to concerns that sediment in the area around Dover Dam has been impacted by the Ashland Oil spill in 1995 (see Section 4.4), it is recommended that samples be taken of the river sediments in the area where the construction will take place.
- Due to a 2004 USACE boring that revealed possible petroleum contamination located near the dam, it is recommended that soil and groundwater samples be taken in the area around EC-GS boring C-04-05. This is in reference to the petroleum that was encountered during drilling in the right-hand bench downstream from the dam.
- Ohio EPA and the receiving landfill require that samples of the railroad ties, and soil
 where the ties lay, be taken for disposal purposes. Though not considered a hazardous
 waste, railroad ties are still required to be subjected to Toxicity Characteristic Leaching
 Procedure (TCLP) analysis prior to disposal at the appropriate facility.
- Due to the vault toilets being located within the CWL, samples for fecal coliform should be taken to ensure worker safety in the event of excavation near the leach field for these toilets.
- If additional poles or discarded materials are found during construction in the area surrounding where the power pole was found while Dover Dam personnel excavated for

- the stormwater pipe, EC-CE should be notified to determine the need for additional investigation regarding the poles or other wastes that may be encountered.
- It should be noted that the entire downstream portion of the proposed access road was not accessed during the site visit due to inclement weather and the accelerated schedule associated with this project. Recommendations given within this report are made based on the portions of the proposed access road that were accessible during the site visit, as well as photos that were taken by other USACE personnel who conducted site visits prior to this report. It is recommended that during the DDR phase, EC-CE conduct a complete walkthrough of the entire proposed access road to clear the area of HTRW concerns.

If work plans change to include any areas that were not investigated for HTRW concerns during this investigation, then those areas would require a Phase I HTRW Environmental Site Assessment before proceeding with construction of the dam safety assurance project.

References

ASTM E 1527-00, Standard Practices for Environmental Site Assessments: Phase I Environmental Site Assessment Process. (January 28, 2002)

ASTM E 1528-00, Standard Practices for Environmental Site Assessments: Transaction Screening Process. (January 28, 2002)

EM 385-1-1, Safety and Health Requirements Manual. (November 3, 2003)

CEORD-RE Memorandum dated 26 July 1994; subject: Policy for Acquiring Lands with Known or Suspected USTs. (July 26, 1994)

EM 200-1-2, Technical Project Planning Guidance for HTRW Data Quality Design. (August 31, 1998)

ER 1165-2-132, Hazardous, Toxic, and Radioactive Waste (HTRW) Guidance for Civil Works Projects. (June 26, 1992)

Work Instruction 3.36.2, Phase I ESA (March 28, 2003)

Ohio EPA study entitled "Biological and Sediment Study of the Tuscarawas River" (February 29, 1996)

1 Introduction

The Environmental and Remediation Section of the Huntington District, United States Army Corps of Engineers (CELRH EC-CE) conducted a Phase I Hazardous, Toxic, and Radioactive Waste (HTRW) Environmental Site Assessment (ESA) on the proposed Contract Work Limits (CWL) of the Dover Dam Safety Assurance (DSA) Project. Dover Dam is located approximately 3.5 miles north of Dover, Tuscarawas County, Ohio adjacent to State Route 800. (The exact location of the proposed Contract Work Limits is outlined in Attachment 1, and the general location of the area under investigation has been circled on the current Dover, OH USGS topographical map also located in Attachment 1.) Under the proposed DSA Project, the existing Dover Dam would be anchored to bedrock to prevent the dam from sliding during dangerously high water events. The proposed project would decrease the opportunity for the dam to fail in a critical flood event. The purpose of this Phase I HTRW ESA is to identify environmental conditions and to identify the potential presence of HTRW contamination located in the project's CWL. The investigation was performed in accordance with ASTM E-1527-00 and 1528-00 Standards, U.S. Army Corps of Engineers (USACE) HTRW policies and CELRH ISO 9001 requirements.

1.1 Purpose

Phase I HTRW ESAs are performed to ensure the Government does not work on or purchase contaminated property containing any recognized environmental condition. The ESA identifies any HTRW concerns prior to design phase and cost developments for any USACE project. The following assessments were performed in accordance with ASTM E-1527-00 and 1528-00 Standards, USACE HTRW policies and CELRH ISO 9001 requirements.

1.2 Project History

Dover Dam, located in Tuscarawas County, Ohio, is one of a system of dams designated to provide flood control and water conservation in the Muskingum watershed in northeastern Ohio. The dam, which is located 173.6 miles above the confluence of the Muskingum River with the Ohio River, forms a small conservation pool for replenishing water resources below the dam in dry periods and for recreational purposes in the area. The dam site, located in the Tuscarawas River basin, approximately three and one-half miles northeast of the town of Dover, Ohio, was built between 1935 and 1938. The drainage area above the site is 1,397 square miles, of which 620 square miles are controlled by the Atwood, Bolivar, and Leesville reservoirs. Dover Dam is a concrete gravity structure with a maximum height of 83 feet above streambed.

Recent USACE studies have determined that if a catastrophic flood event occurs on the Tuscarawas River, Dover Dam would not be able to withstand the force of the floodwater and

would incur slipping. As a result of the studies, the USACE is proposing a project that would anchor the dam to bedrock to prevent any dam slippage during a record flooding event.

1.3 Scope of Work

Fieldwork for the assessments consisted of a site visit to observe the existing environmental conditions at the CWL and neighboring properties. Field investigations of areas in the CWL were performed on 31 October 2006. During the field investigation, physical inspection of the ground surface was conducted for signs of contamination which include stained soil, stressed or discolored vegetation, surface debris, underground storage tank (UST) fill caps or vent lines, unusual formations or depressions in the ground, and monitoring wells. This site investigation also included assessment of adjacent properties for potential contamination. Photographs of all potential contamination concerns on the subject area, and also adjoining properties, were taken and are located in Attachment 6.

A site map showing the location of the Dover Dam DSA CWL was obtained and compared with maps containing federal and state records, which show environmentally sensitive occurrences and activities in the surrounding project area. Federal and State databases were accessed using a commercial database retrieval company and are available for review in Attachment 3.

Sixty-year title ownership histories for properties within the CWL not under USACE ownership were researched in the Tuscarawas County Courthouse, located in New Philadelphia, Ohio. In instances where properties within the CWL were owned by the USACE, Real Estate files located in the Huntington, West Virginia District Office were researched. Property ownership histories for the tracts not under USACE ownership were developed in accordance with ASTM E 1527 and 1528 Standards. The sixty-year deed research was performed in order to determine past and present ownerships and usage of each property. Sixty-year title ownership histories for tracts not under USACE ownership can be located in Attachment 2.

Interviews were conducted with Dover Dam personnel to obtain specific information about past activities and current conditions on properties located within the CWL. Interviews with state and local officials were also conducted to determine if any potential HTRW concerns exist on the target area or adjacent tracts. Interview information concerning the CWL can be located in Attachment 6.

Based on the information collected, the CWL was evaluated for signs of environmental contamination that would require mitigation in accordance with federal and state laws.

1.4 Investigation Limitations

The purpose of this ESA is to provide information on the environmental conditions of the subject CWL. An ESA can reduce, but not eliminate, uncertainty regarding the potential for recognized environmental conditions in connection with these sites. The investigations were performed solely on the information available to CELRH-EC-CE at the time of the investigation. The conclusions from this report are based on information obtained from federal and state

environmental records, public records, and interviews with property owners and local officials. Visual observations related to hazardous materials or wastes on the site only represent conditions at the time of the site visit. No warranties or certifications can be provided by CELRH-EC-CE concerning the accuracy or completeness of the information reviewed during this investigation. No aerial photographs were available for the property under investigation.

The determination of potential HTRW contamination should not be considered as definite assertion that an environmentally sensitive condition actually exists. The conclusions and recommendations contained within this investigation are based on information gathered using the degree of care and skill ordinarily associated with a competent member of the environmental profession and no warranties are expressed or implied.

2 Site Descriptions and Investigative Findings

A field investigation of the proposed Dover Dam DSA CWL area was performed on October 31, 2006. During the field investigation, physical inspection of the ground surface was conducted on the property and adjacent properties for signs of environmental contamination. Photographs of the subject property were taken and are located in Attachment 6. These photographs serve as documentation of the field investigation findings.

Right Descending Bank of CWL

The Right Descending Bank of the CWL is bordered by Ohio State Route 800 and the Tuscarawas River in the areas around Dover Dam. This area is to be included in the CWL for the Dover Dam DSA Project. The items of concern that were observed during the visit were as follows:

- There was a large area of dredge material disposed of along the second streambank tier upstream from the dam. During a closer inspection of this material, there were several small areas where a liquid with sheen was leaking from the dredge material. It was apparent that the material was put in this location to decant water following dredging from the upstream side of Dover Dam. The water from the discarded dredge material was allowed to flow back over land to the Tuscarawas River from the decant location.
- There is a large area of discolored rock below the parking area upstream of the dam. The rock appeared to be fairly heavily stained but it was unclear whether this happened while the rock had been in that location or whether the rock had been delivered that way.
- There was a set of three transformers located on a power pole in the upstream parking lot. There were no signs of leakage from these transformers.
- There was a small area of staining in the gravel access road located slightly upstream of the dam.
- At the day use area downstream from the dam, there are restrooms that utilize pit toilets.
 There were also several stormwater runoff pipes from State Route 800 that empty into this area.

Based on the field investigation there is evidence that the area being used to decant the dredge material, as well as the area where EC-GS encountered petroleum during drilling (see Section 4.5.3), may contain HTRW concerns that would impact the proposed CWL.

Within the Dam

While conducting the site visit to the Dover Dam CWL, EC-CE personnel also conducted a site visit to the internal workings of the dam to ensure no operations within the dam would adversely affect the surrounding environment. The items observed during the visit were as follows:

- There is a small diesel tank located with the emergency generator in the Control House of the dam. There is a secondary containment system with this and it appeared to be well kept.
- There is a 750-gallon oil storage tank located in the gallery that is used to raise the hydraulic gates. Dover Dam personnel mentioned that approximately 5 years ago the oil within the gate system was changed for the first time since the dam was constructed.
- It was noted during the site visit that hydraulic oil is used to raise and lower the gates of the dam. It was apparent in a few of the gates that they had leaked oil in the past. Approximately 7 feet away from all of the gates is a series of grating. It was obvious that in a few instances the gates which leaked the hydraulic oil did so directly into this grating. The grating also houses the foundation drains of the dam, which act as relief wells during high flow times, allowing water to be pushed up into the dam. Dover Dam personnel said they had never observed the drains leave the pipes into the grating. As it was described to EC-CE personnel, if water were to overflow from the foundation drains and get into the grating the water would be transported back to the river via a sump pump. Even though oil could possibly be released into this grating system, it is unlikely that the oil would be transported to the bedrock underneath the dam via the foundation drains due to the fact that water has not reportedly overtopped the foundation drains.

Based on the field investigation there is no evidence that the internal workings of Dover Dam cause environmental or HTRW concerns that would impact the proposed CWL.

Left Descending Bank of CWL

The Left Descending Bank of the CWL is bordered by the original Pennsylvania Railroad Line and the Tuscarawas River in the area around Dover Dam. This area is to be included in the CWL for the Dover Dam DSA Project.

• There was an area of dredge material disposed of along the streambank upstream from the dam. It was apparent that the material was put in this location to decant water following dredging from the upstream side of Dover Dam. The water from the discarded dredge material was allowed to flow back over land to the Tuscarawas River from the decant location. While excavating to replace a stormwater pipe, project personnel encountered what was believed to be a portion of a power pole. It was unclear whether this pole was just a single instance or a portion of a greater dump area.

Based on the field investigation there is evidence that the area being used to decant the dredge material may contain HTRW concerns that would impact the proposed CWL.

Proposed Access Road

The Proposed Access Road of the CWL follows Township Highway 317 until it intersects with the abandoned Pennsylvania Railroad line. The proposed route then follows the Pennsylvania Railroad line past Dover Dam until it connects with the next bridge approximately 3 miles upstream on the Tuscarawas River. This area is to be included in the CWL for the Dover Dam DSA Project. The items observed during the visit were as follows:

- There are several areas along this proposed route that contain railroad ties either laying in piles off to the side of the road or ties that remain in the original railroad bed.
- There is a natural gas line that runs near the Pennsylvania Railroad in the vicinity of Dover Dam.

Based on the field investigation there is evidence that the area with abandoned railroad ties may contain environmental concerns that would impact the proposed CWL. Ohio EPA and the receiving landfill require that samples of the railroad ties, and soil where the ties lay, be taken for disposal purposes. Though not considered a hazardous waste, railroad ties are still required to be subjected to Toxicity Characteristic Leaching Procedure (TCLP) analysis prior to disposal at the appropriate facility.

It should be noted that the entire downstream portion of the proposed access road was not accessed during the site visit due to inclement weather and the accelerated schedule associated with this project. Recommendations given within this report are made based on the portions of the proposed access road that were accessible during the site visit, as well as photos that were taken by other USACE personnel who conducted site visits prior to this report. It is recommended that during the DDR phase, EC-CE conduct a complete walkthrough of the entire proposed access road to clear the area of HTRW concerns.

3 Records Review

3.1 Ownership Histories

Sixty-year ownership histories for properties within the CWL were researched by EC-CE personnel. Chains-of-ownership were established for tracts not previously owned by USACE in the CWL by reviewing current deeds and confirming the information in the Tax Assessor record by means of Deed Books. Grantee and Grantor indices were used to identify earlier deeds; however, some risk of being misled was assumed using this method due to the vague and non-specific nature of older deeds. Real Estate information for tracts currently owned by USACE

was researched in the Huntington District's Real Estate files for inclusion in this report. Due to the extent of information available in the USACE Real Estate files, the deed information was not included with this report. Tables containing information on ownership transfers are presented in Attachment 2. The result of each ownership history is reviewed in Section 4.2 of this report.

3.2 Federal and State Records

Records of regulatory agencies listing recognized environmental conditions in connection with each property were accessed through Environmental Data Resources (EDR), a commercial data retrieval company located in Milford, CT. The information provided from EDR is located in Attachment 3. EDR provided information from the following databases:

3.2.1 Federal Databases

The following federal databases were researched:

NPL National Priority List

Proposed NPL Proposed National Priority List Sites

CERCLIS Comprehensive Environmental Response, Compensation, and Liability

Information System

CERC-NFRAP CERCLIS No Further Remedial Action Planned

CORRACTS Corrective Action Report

RCRIS-TSD Resource Conservation and Recovery Information System – Treatment,

Storage and Disposal Facilities

RCRIS-LQG Resource Conservation and Recovery Information System – Large

Quantity Generators

RCRIS-SQG Resource Conservation and Recovery Information System – Small

Quantity Generators

ERNS Emergency Response Notification System

3.2.2 State Databases

The following state databases were researched:

SHWS State equivalent of CERCLIS SWF/LF Solid Waste Facilities List

UST Underground Storage Tank DatabaseVCP Voluntary Cleanup Program SitesLUST Leaking Underground Storage Tanks

OH Spills Ohio Spills Database

3.3 Historical Mapping and Photos

Per ASTM E 1527-00, Section 7.3 on historical use information, a review of reasonably ascertainable standard historical sources was performed as a part of this investigation. The

purpose of a historical records search is to determine the past uses of each property. The current and historical USGS 7.5-minute topographic maps were available for examination. Copies of the current and historical USGS topographic maps are located in Attachment 1. Aerial photographs and historic fire insurance maps were not available for this area.

4 Findings

In accordance with USACE HTRW Policy, a Quality Control Plan (QCP) and Site-Specific Safety and Health Plan (SSHP) were developed and implemented prior to and during all phases of this investigation. Procedures and documentation of the QCP are located in Attachment 4 and the SSHP is located in Attachment 5.

4.1 Field Investigation

A field investigation of the Dover Dam DSA CWL was performed on 31 October 2006. During the field investigation, physical inspection of the ground surface was conducted on the property and adjacent properties for signs of environmental contamination. Photographs located in Attachment 6 document the field investigation findings. See Section 2 and Recommendations (Section 5) for a complete listing of areas with environmental concerns.

4.2 Review of Ownership Histories

Property ownership histories for areas within the CWL were developed in accordance with ASTM 1527-00 and 1528-00 Standards. These histories were researched by CELRH EC-CE personnel. Sixty year ownership histories were researched for the CWL. Records of the ownership histories are located in Attachment 2. No potential HTRW or other environmental concerns were noted due to the ownership history review.

4.3 Interviews

Interviews were conducted with USACE Dover Dam personnel and local government officials. These individuals have extensive knowledge of the project area. Attachment 6 contains summaries of the interviews conducted for this report and HTRW issues that arose from those interviews.

4.4 Ashland Oil Spill

During research for this project, it was learned that a major oil spill occurred approximately 15 miles upstream from Dover Dam. A pipeline construction company was laying a new high pressure petroleum pipeline in close proximity to an active high pressure crude oil transmission pipeline operated by Ashland Oil pipeline and sheared off a valve within 50 feet of the Tuscarawas River on June 7, 1995. Over 300 barrels of crude oil discharged to the Tuscarawas River from this incident. Containment booms were deployed at several locations downstream with limited success; eventually the crude oil was contained behind Dover Dam, approximately 15 miles upstream from the spill site. The dam and containment boom stopped the majority of

the crude oil with only a sheen passing through the dam. See Attachment 6 for a report containing information on biological and contamination sampling and results information along the Tuscarawas River.

4.5 USACE Records Research

Historical documentation from USACE records (including As-built drawings, boring locations, ERGO Reports) were researched for this Phase I HTRW ESA. The results of this historical research are provided in the following sections.

4.5.1 Environmental Review Guide to Operations (ERGO) Reports

Three Environmental Compliance Reviews have been conducted on Dover Dam by Huntington District's Operations and Readiness Division. For the ERGO environmental compliance reviews, Operations and Readiness Division conducts a site visit and provides recommendations to ensure that routine project operations are in compliance with all Federal, State, and local environmental laws, regulations, and directives. The three ERGO Reports for Dover Dam were generated on 17 February 1994, 23 April 1998, and 22 March 2004. Several notes were made concerning possible environmental concerns from the ERGO Reports, but they have been addressed in other portions of this report. In one instance in an ERGO report, it was reported that See Attachment 6 for copies of the Dover Dam ERGO reports.

4.5.2 As-Built Drawings of Dover Dam

As-built drawings of the construction of Dover Dam were reviewed to ensure that no USTs or other features were built at the dam that could indicate possible HTRW contamination. No items were found during the review of these drawings that would indicate possible HTRW contamination. To view the As-built drawings examined in preparation of this report, see Attachment 6.

4.5.3 Review of Previous Boring Logs

USACE Huntington District Soils Section (EC-GS) boring logs of previous drilling conducted at Dover Dam were reviewed by EC-CE personnel in preparation for this report. It was discovered that on April 28, 2004, EC-GS encountered a petroleum odor at one of the boring locations along the right descending bank following the dam. The petroleum odor was encountered at a depth of 20' on the second bench near the downstream abutment. The contamination became so obvious that at 35.5' they had to abort the drilling. At that time the crew decontaminated the drill into 55-gallon drums. Due to limited project funding at that time, no additional Phase II ESA work was conducted to verify the presence of the petroleum, verify the source of the contamination, or determine the extent of contamination. To view the boring log for this location, see Attachment 6.

4.6 Review of Federal and State Regulatory Records

Results of the database records review are presented in the following sections. The following sections list the mapped and unmapped (orphan) sites that are given in the researched environmental databases. The complete EDR database search report is located in Attachment 3.

4.6.1 NPL

The National Priorities List (NPL) is a subset of CERCLIS and identifies over 1200 sites for priority cleanup of hazardous waste sites identified for priority remedial actions under the Superfund Program. A site must meet or surpass a predetermined hazard ranking system score, be chosen as a state's top priority site, or meet three specific criteria set jointly by the United States Department of Health and Human Services and the United States Environmental Protection Agency to become an NPL site. There are no mapped or proposed NPL sites reported within a 1.0 mile radius around the proposed Dover Dam DSA CWL.

4.6.2 CERCLIS-NFRAP

The Comprehensive Environmental Response Compensation and Liability Information System (CERCLIS) No Further Remediation Planned (NFRAP) are archived sites that have been removed and archived from the inventory of CERCLIS sites. There are no mapped CERCLIS sites reported within a 0.5 mile radius around the proposed Dover Dam DSA CWL.

There is one (1) orphan CERCLIS-NFRAP site with a vague location given. Based on visual inspections and the general location of the site that was given, this orphan site does not appear to pose any environmental concerns to the proposed Dover Dam DSA CWL.

4.6.3 CORRACTS

The EPA maintains this database of RCRA facilities that are undergoing corrective action. A corrective action order is issued pursuant to RCRA Section 308 (h) when there has been a release of a hazardous waste into the environment from a RCRA facility. Corrective actions may be required regardless of when the release occurred, even if it predates RCRA. There are no mapped CORRACTS sites reported within a 1.0 mile radius around the proposed Dover Dam DSA CWL.

4.6.4 RCRIS-TSD

The Resource Conservation and Recovery Information System – Treatment, Storage and Disposal Facilities (RCRIS-TSD) database contains information on facilities that either treat, store, or dispose of hazardous wastes. There are no mapped RCRIS-TSD sites reported within a 1.0 mile radius around the proposed Dover Dam DSA CWL.

4.6.5 RCRIS-LQG

The Resource Conservation and Recovery Information System – Large Quantity Generators (RCRIS-LQG) database contains information on facilities that produce more than 1000kg of EPA regulated hazardous waste per month or meet other applicable requirements of the Resource Conservation and Recovery Act. There are no mapped RCRIS-LQG sites reported within a 0.75 mile radius around the proposed Dover Dam DSA CWL.

4.6.6 RCRIS-SQG

The Resource Conservation and Recovery Information System – Small Quantity Generators (RCRIS-SQG) database contains information on facilities that generate between 100kg and 100kg of EPA regulated hazardous waste per month or meet other applicable requirements of the Resource Conservation and Recovery Act. There are no mapped RCRIS-SQG sites reported within a 0.75 mile radius around the proposed Dover Dam DSA CWL.

There are five (5) orphan RCRIS-SQG sites with vague locations given. Based on visual inspections and the general location of the site that was given, these orphan sites do not appear to pose any environmental concerns for the proposed Dover Dam DSA CWL.

4.6.7 ERNS

The Emergency Response Notification System (ERNS) is a national database containing records from October 1986 and is used to collect information for reported releases of oil and hazardous substances. The database contains information from spill records made to federal authorities including the EPA, US Coast Guard, National Response Center, and Department of Transportation. There are no mapped ERNS sites reported within a 1.0 mile radius of the proposed Dover Dam DSA CWL.

4.6.8 MINES

The source of the Mines Master Index File is the Department of Labor, Mine Safety and Health Administration. There are two (2) mapped MINES sites within 0.75 miles of the proposed Dover Dam DSA CWL. Based on visual inspections and locations of the site that was given, these sites do not appear to pose any environmental concerns for the proposed Dover Dam DSA CWL.

4.6.9 SHWS

The State Hazardous Waste Sites (SHWS) records are the state's equivalent to CERCLIS. These sites may or may not already be listed on the federal CERCLIS list. The data come from the Department of Environmental Protection's Uncontrolled Site Branch. There are no mapped SHWS sites reported within a 1.0 mile radius of the proposed Dover Dam DSA CWL.

4.6.10 SWF/LF

The Ohio Solid Waste Facility/Landfill Facilities (SWF/LF) List contains a summary of information pertaining to all permitted solid waste landfills and processing facilities operating within the State of Ohio. There are no mapped SWF/LF sites reported within a 0.5 mile radius around the proposed Dover Dam DSA CWL.

4.6.11 UST

The Ohio Underground Storage Tank (UST) report is a listing of all registered active and inactive underground storage tanks located within the State of Ohio. There are no mapped UST sites reported within a 1.0 mile radius of the proposed Dover Dam DSA CWL. There is one (1) Leaking Underground Storage Tank site mapped from the Leaking Underground Storage Tank Database. This site is listed as the Dover Dam. EC-CE personnel contacted Verne Ord, Assistant Bureau Chief of the Ohio State Fire Marshall's UST Division, who stated that the site has received a No Further Action assessment. The tanks which were removed were located at the area office, ½ mile upstream from the dam.

There are four (4) orphan LUST sites with vague locations given. Based on visual inspections and the general location of the sites that were given, these orphan sites do not appear to pose any environmental concerns for the proposed Dover Dam DSA CWL.

4.6.12 FINDS

The Facility Index System contains both facility information and "pointers" to other sources of information that contain more detail. These include: RCRIS, PCS, AIRS, FATES, TSCA, FTTS, CERCLIS, DOCKET, FURS, FRDS, SIA, CICS, PADS, RCRA-J, TRIS, and TSCA. The source of this information is the U.S. EPA/NTIS. The one (1) mapped FINDS site reported within a 0.5 mile radius around the target area was Dover Dam. EC-CE personnel contacted Ohio EPA personnel to verify this "hit" and to clarify the reasoning behind the FINDS label. Paula Canten, Ohio EPA, was contacted concerning this identification. Mrs. Canten informed EC-CE personnel that the FINDS label was in reference to a label in Ohio EPA's database that the Dam site is listed in the "Drinking Water Source Treatment Unit". It is believed that this label is due to the fact that the dam contains a water softener and has been found to have elevated levels of iron in the potable water onsite. Use of the site's water system for drinking water was stopped once the elevated iron was detected.

There are six (6) orphan FINDS sites with vague locations given. Based on visual inspections and the general location of the sites that were given, these orphan sites do not appear to pose any environmental concerns for the proposed Dover Dam DSA CWL.

4.6.13 FTTS

The FTTS tracks administrative cases and pesticide enforcement actions and compliance activities related to the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA), Toxic

Substances Control Act (TSCA), and Emergency Planning and Community Right to Know Act (EPCRA). There are no mapped FTTS sites reported within a 0.5 mile radius around the proposed Dover Dam DSA CWL.

4.6.14 DERR

The Division of Emergency and Remedial Response's Database (DERR) listings contains sites from all of Ohio that are in the DERR database. There are no mapped DERR sites reported within a 1.5 mile radius around the proposed Dover Dam DSA CWL.

There is one (1) orphan DERR sites with vague locations given. Based on visual inspection and the general location of the site that was given, this orphan site does not appear to pose any environmental concerns for the proposed Dover Dam DSA CWL.

4.6.15 Orphan Sites

Orphan sites are sites reported in the UST database that could not be mapped by EDR due to unclear or inadequate address information. There were twenty (20) orphan sites within a 1.5 mile radius of the proposed Dover Dam DSA CWL. Based on visual inspections and the general location of the sites given, there are no environmental concerns associated with these orphaned sites.

The following state/federal databases were also accessed but did contain have sites listed in the vicinity of the project site: US ENG CONTROLS, US INST CONTROLS, DOD, US BROWNFIELDS, CONSENT, ROD, UMTRA, ODL, SSTS, ICIS, TOWNGAS, HIST LF, DRYCLEANERS, USD.

4.7 Historical Photographs and Mapping

Current and historical USGS topographic maps were reviewed and did not indicate any activities that would cause HTRW concerns on the target property. There were no aerial photographs or fire insurance maps available at the time of this investigation. Copies of the current and historical USGS topographical maps are located in Attachment 1.

5 Recommendations

A Phase I HTRW Environmental Site Assessment was performed on properties located within the proposed Dover Dam DSA CWL in Dover, Ohio in accordance with ASTM Standards 1527-00 and 1528-00.

Based on the research and site visit conducted as part of this ESA there are several environmental and/or HTRW concerns that would impact the proposed activities on the property. The following recommendations are given concerning areas within the proposed CWL associated with this project.

- During the site visit it was noted that USACE personnel at Dover apply (or have applied) dredged material to an area near both the left and right hand descending streambank above the dam to decant the water from the material prior to disposal. It is recommended that soil samples be taken of the dredge material and soil underneath the dredge material. This recommendation is made to ensure that no HTRW or other contamination is present in the dredge material that has been applied to these areas.
- Due to concerns that sediment in the area around Dover Dam has been impacted by the Ashland Oil spill in 1995 (see Section 4.4), it is recommended that samples be taken of the river sediments in the area where the construction will take place.
- Due to a 2004 USACE boring that revealed possible petroleum contamination located near the dam, it is recommended that soil and groundwater samples be taken in the area around EC-GS boring C-04-05. This is in reference to the petroleum that was encountered during drilling in the right-hand bench downstream from the dam.
- Ohio EPA and the receiving landfill require that samples of the railroad ties, and soil where the ties lay, be taken for disposal purposes. Though not considered a hazardous waste, railroad ties are still required to be subjected to Toxicity Characteristic Leaching Procedure (TCLP) analysis prior to disposal at the appropriate facility.
- Due to the vault toilets being located within the CWL, samples for fecal coliform should be taken to ensure worker safety in the event of excavation near the leach field for these toilets.
- If additional poles or discarded materials are found during construction in the area surrounding where the power pole was found while Dover Dam personnel excavated for the stormwater pipe, EC-CE should be notified to determine the need for additional investigation regarding the poles or other wastes that may be encountered.
- It should be noted that the entire downstream portion of the proposed access road was not accessed during the site visit due to inclement weather and the accelerated schedule associated with this project. Recommendations given within this report are made based on the portions of the proposed access road that were accessible during the site visit, as well as photos that were taken by other USACE personnel who conducted site visits prior to this report. It is recommended that during the DDR phase, EC-CE conduct a complete walkthrough of the entire proposed access road to clear the area of HTRW concerns.

If work plans change to include any areas that were not investigated for HTRW concerns during this investigation, then those areas would require a Phase I HTRW Environmental Site Assessment before proceeding with construction of the dam safety assurance project.

6 References

ASTM E 1527-00, Standard Practices for Environmental Site Assessments: Phase I Environmental Site Assessment Process. (January 28, 2002)

ASTM E 1528-00, Standard Practices for Environmental Site Assessments: Transaction Screening Process. (January 28, 2002)

EM 385-1-1, Safety and Health Requirements Manual. (November 3, 2003)

CEORD-RE Memorandum dated 26 July 1994; subject: Policy for Acquiring Lands with Known or Suspected USTs. (July 26, 1994)


EM 200-1-2, Technical Project Planning Guidance for HTRW Data Quality Design. (August 31, 1998)

ER 1165-2-132, Hazardous, Toxic, and Radioactive Waste (HTRW) Guidance for Civil Works Projects. (June 26, 1992)

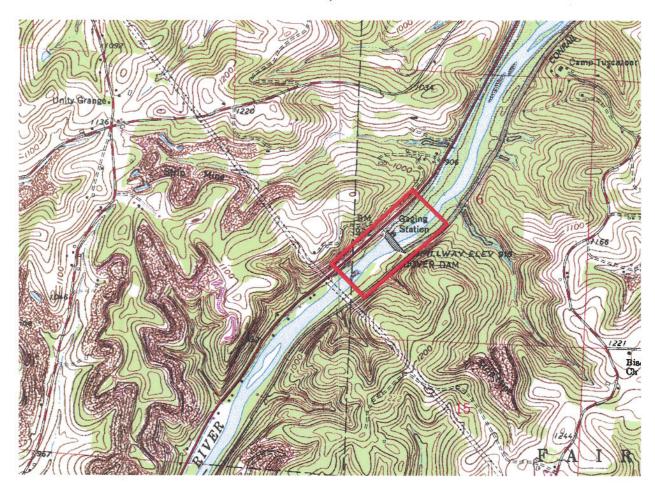
Work Instruction 3.36.2, Phase I ESA (March 28, 2003)

Ohio EPA study entitled "Biological and Sediment Study of the Tuscarawas River" (February 29, 1996)

ATTACHMENT 1
Site Location and Topographic Maps



Phase I HTRW Investigation Report Dover Dam Safety Assurance Project Dover, Ohio



Dover, Ohio USGS Topographical Map Scale 1:24000 The Contract Work Limits are identified with red outline.



EDR Historical Topographic Map Report

Dover Dam Route 800 Dover, OH 44622

Inquiry Number: 1781681.4

October 24, 2006

The Standard in **Environmental Risk Management Information**

440 Wheelers Farms Rd Milford, Connecticut 06461

Nationwide Customer Service

Telephone: 1-800-352-0050

Fax:

1-800-231-6802

Internet:

www.edrnet.com

EDR Historical Topographic Map Report

Environmental Data Resources, Inc.s (EDR) Historical Topographic Map Report is designed to assist professionals in evaluating potential liability on a target property resulting from past activities. EDRs Historical Topographic Map Report includes a search of a collection of public and private color historical topographic maps, dating back to the early 1900s.

Thank you for your business.

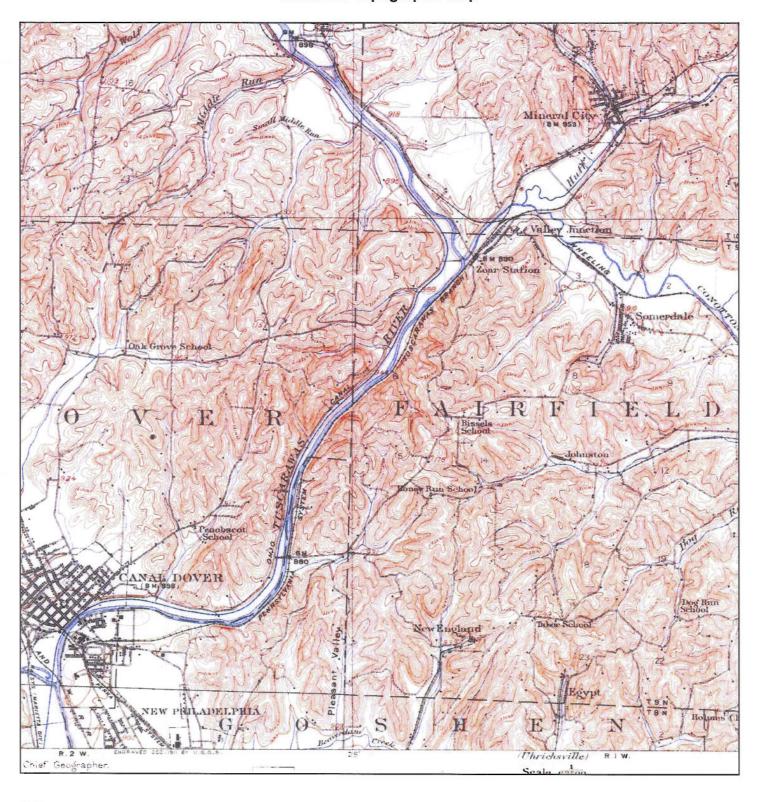
Please contact EDR at 1-800-352-0050 with any questions or comments.

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TARGET QUAD NAME: **DOVER** MAP YEAR: 1912

SERIES: 15

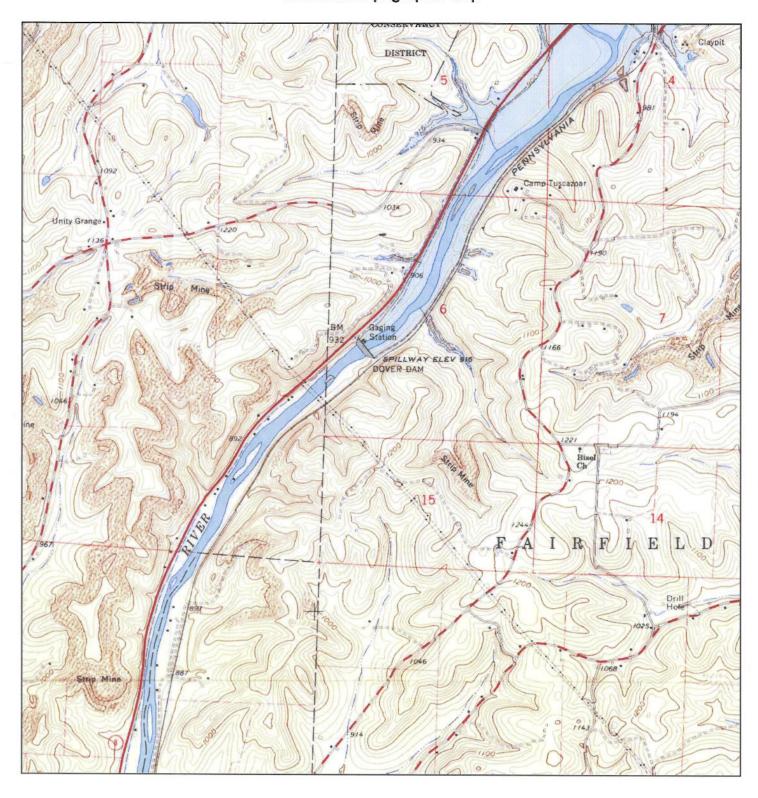
SCALE: 1:62500

SITE NAME: Dover Dam ADDRESS: Route 800

Dover, OH 44622

LAT/LONG: 40.5573 / 81.4126 CLIENT: U.S. Army Corps of Engineers

CONTACT: Nick McHenry INQUIRY#: 1781681.4 RESEARCH DATE: 10/24/2006

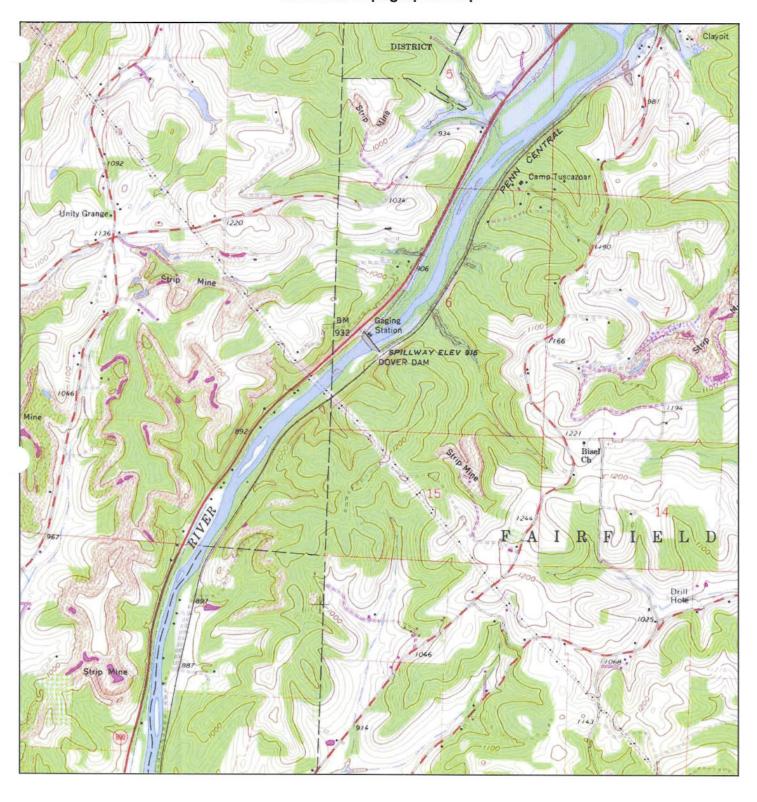


N T TARGET QUAD NAME: DOVER MAP YEAR: 1961

SERIES: 7.5 SCALE: 1:24000 SITE NAME: Dover Dam ADDRESS: Route 800

Dover, OH 44622 LAT/LONG: 40.5573 / 81.4126 CLIENT: U.S. Army Corps of Engineers
CONTACT: Nick McHenry

INQUIRY#: 1781681.4 RESEARCH DATE: 10/24/2006





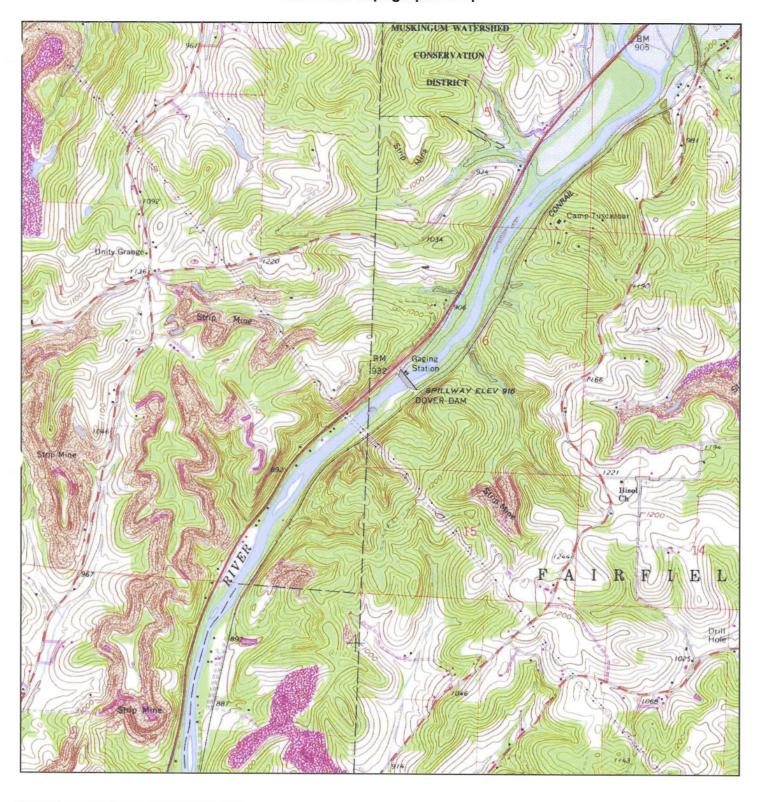
TARGET QUAD NAME: DOVER MAP YEAR: 1971

PHOTOREVISED: 1961

SERIES: 7.5 SCALE: 1:24000 SITE NAME: Dover Dam ADDRESS: Route 800

Dover, OH 44622 LAT/LONG: 40.5573 / 81.4126 CLIENT: U.S. Army Corps of Engineers

CONTACT: Nick McHenry INQUIRY#: 1781681.4 RESEARCH DATE: 10/24/2006



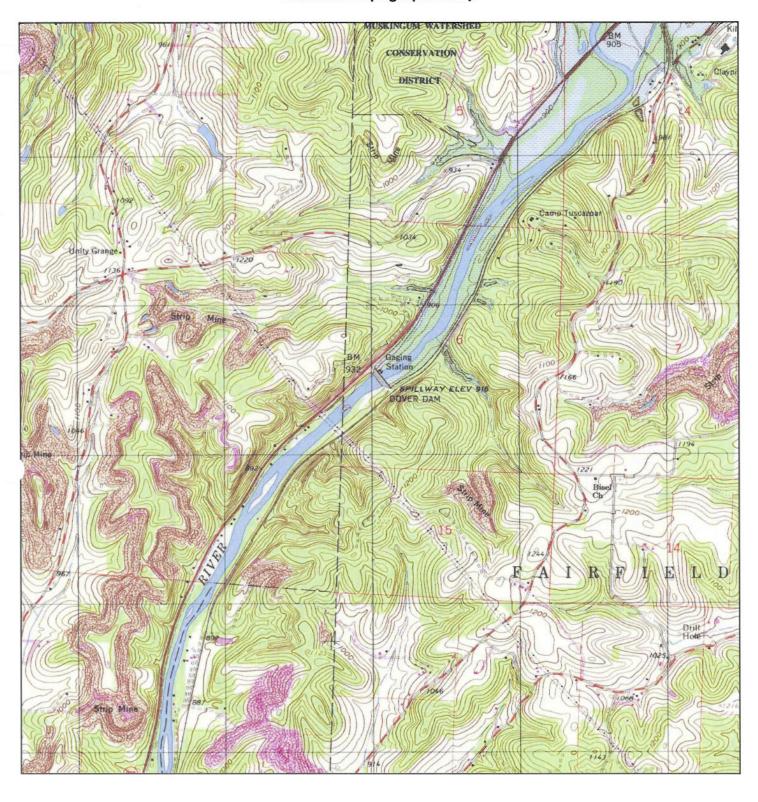
N

TARGET QUAD NAME: DOVER MAP YEAR: 1984 PHOTOREVISED: 1961

SERIES: 7.5 SCALE: 1:24000 SITE NAME: Dover Dam ADDRESS: Route 800

Dover, OH 44622 LAT/LONG: 40.5573 / 81.4126 CLIENT: U.S. Army Corps of Engineers

CONTACT: Nick McHenry INQUIRY#: 1781681.4 RESEARCH DATE: 10/24/2006



N

TARGET QUAD NAME: **DOVER** MAP YEAR: 1994

SERIES: 7.5 SCALE: 1:24000

ADDRESS: Route 800 Dover, OH 44622 LAT/LONG: 40.5573 / 81.4126

SITE NAME: Dover Dam

CLIENT: U.S. Army Corps of Engineers

CONTACT: Nick McHenry 1781681.4 INQUIRY#: RESEARCH DATE: 10/24/2006

ATTACHMENT 2
Ownership Histories

Pike County Tributaries Section 202 Nonstructural Project

TRACT	GRANTOR	GRANTEE	D.B. /P.G.	TRANSFER DATE	NOTES
1	Floyd Kimble	Doris Kimble	1236/1925	28-Sep-06	
	Theodore Breyer	Floyd Kimble	512/251	1-Mar-75	0
	George and Thelma Judy	Theodore Breyer	363/338	22-May-56	No further deed information was found prior to this date.
2	William Schwarm	Margaret Schwarm	1221/2527	24-Apr-06	
	Rudolph Luthy	William and Margaret Schwarm	391/438	28-Jul-59	
	Rudolph Luthy	State of Ohio	248/6	31-Oct-40	Easment - Shows ownership by M Luthy prior to '40

It should be noted that there were many other deed histories investigated for the preparation of this Phase I HTRW Investigation. The deed histories listed above are tracts within the primary CWL which are still owned by private individuals. A large number of documents located in LRH's Real Estate file room were researched, but due to space constraints within this report were not included. These files will remain on file in RE's file room.

ATTACHMENT 3
Environmental Database Search



The EDR Radius Map with GeoCheck®

Dover Dam Route 800 Dover, OH 44622

Inquiry Number: 1781681.2s

October 24, 2006

The Standard in Environmental Risk Management Information

440 Wheelers Farms Road Milford, Connecticut 06461

Nationwide Customer Service

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Physical Setting Source Addendum	A-1
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EXECUTIVE SUMMARY

A search of available environmental records was conducted by Environmental Data Resources, Inc (EDR). The report was designed to assist parties seeking to meet the search requirements of EPA's Standards and Practices for All Appropriate Inquiries (40 CFR Part 312), the ASTM Standard Practice for Environmental Site Assessments (E 1527-05) or custom requirements developed for the evaluation of environmental risk associated with a parcel of real estate.

TARGET PROPERTY INFORMATION

ADDRESS

ROUTE 800 DOVER, OH 44622

COORDINATES

Latitude (North): Longitude (West): 40.557300 - 40° 33' 26.3" 81.412600 - 81° 24' 45.4"

Universal Tranverse Mercator: Zone 17 UTM X (Meters): 465067.6

UTM Y (Meters):

465067.6 4489485.5

Elevation:

866 ft. above sea level

USGS TOPOGRAPHIC MAP ASSOCIATED WITH TARGET PROPERTY

Target Property Map:

40081-E4 DOVER, OH

Most Recent Revision: 1997

TARGET PROPERTY SEARCH RESULTS

The target property was identified in the following government records. For more information on this property see page 6 of the attached EDR Radius Map report:

Site	Database(s)	EPA ID
USACE DOVER DAM 5153 ST RTE 800 NE DOVER, OH 44622	FINDS	110006264336
DOVER DAM SR 800 DOVER, OH 44622	LUST Facility Status: Inactive FR Status: NFA: No Further Action	N/A

DATABASES WITH NO MAPPED SITES

No mapped sites were found in EDR's search of available ("reasonably ascertainable ") government records either on the target property or within the search radius around the target property for the following databases:

FEDERAL RECORDS

EXECUTIVE SUMMARY

Proposed NPL..... Proposed National Priority List Sites Delisted NPL National Priority List Deletions
NPL RECOVERY Federal Superfund Liens System CERC-NFRAP..... CERCLIS No Further Remedial Action Planned CORRACTS...... Corrective Action Report RCRA-TSDF...... Resource Conservation and Recovery Act Information RCRA-LQG..... Resource Conservation and Recovery Act Information RCRA-SQG...... Resource Conservation and Recovery Act Information ERNS..... Emergency Response Notification System HMIRS Hazardous Materials Information Reporting System US ENG CONTROLS Engineering Controls Sites List US INST CONTROL...... Sites with Institutional Controls DOD...... Department of Defense Sites FUDS..... Formerly Used Defense Sites US BROWNFIELDS...... A Listing of Brownfields Sites
CONSENT...... Superfund (CERCLA) Consent Decrees ROD Records Of Decision UMTRA..... Uranium Mill Tailings Sites ODI...... Open Dump Inventory TRIS...... Toxic Chemical Release Inventory System TSCA..... Toxic Substances Control Act Rodenticide Act)/TSCA (Toxic Substances Control Act) SSTS..... Section 7 Tracking Systems ICIS...... Integrated Compliance Information System PADS...... PCB Activity Database System MLTS..... Material Licensing Tracking System RAATS______RCRA Administrative Action Tracking System

STATE AND LOCAL RECORDS

..... Division of Emergency & Remedial Response's Database TOWNGAS..... DERR Towngas Database MSL..... Master Sites List SWF/LF....Licensed Solid Waste Facilities HIST LF....Old Solid Waste Landfill UNREG LTANKS....Ohio Leaking UST File UST..... Underground Storage Tank Tank File ARCHIVE UST...... Archived Underground Storage Tank Sites OH Spills Emergency Response Database ENG CONTROLS...... Sites with Engineering Controls INST CONTROL..... Sites with Institutional Engineering Controls VCP.......Voluntary Action Program Sites
DRYCLEANERS.....Drycleaner Facility Listing

SHWS...... This state does not maintain a SHWS list. See the Federal CERCLIS list and

BROWNFIELDS..... Ohio Brownfield Inventory CDL..... Clandestine Drug Lab Locations NPDES General Permit List USD...... Urban Setting Designation Sites HIST INST CONTROLS..... Institutional Controls Database

HIST ENG CONTROLS..... Operation & Maintenance Agreements Database

Federal NPL list.

HIST USD...... Urban Setting Designations Database

EXECUTIVE SUMMARY

TRIBAL RECORDS

INDIAN RESERV..... Indian Reservations

INDIAN LUST..... Leaking Underground Storage Tanks on Indian Land

INDIAN UST..... Underground Storage Tanks on Indian Land

EDR PROPRIETARY RECORDS

Manufactured Gas Plants ... EDR Proprietary Manufactured Gas Plants

SURROUNDING SITES: SEARCH RESULTS

Surrounding sites were identified.

Elevations have been determined from the USGS Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified. Sites with an elevation equal to or higher than the target property have been differentiated below from sites with an elevation lower than the target property.

Page numbers and map identification numbers refer to the EDR Radius Map report where detailed data on individual sites can be reviewed.

Sites listed in bold italics are in multiple databases.

Unmappable (orphan) sites are not considered in the foregoing analysis.

FEDERAL RECORDS

Mines: Mines Master Index File. The source of this database is the Dept. of Labor, Mine Safety and Health Administration.

A review of the MINES list, as provided by EDR, and dated 05/16/2006 has revealed that there are 2 MINES sites within approximately 0.75 miles of the target property.

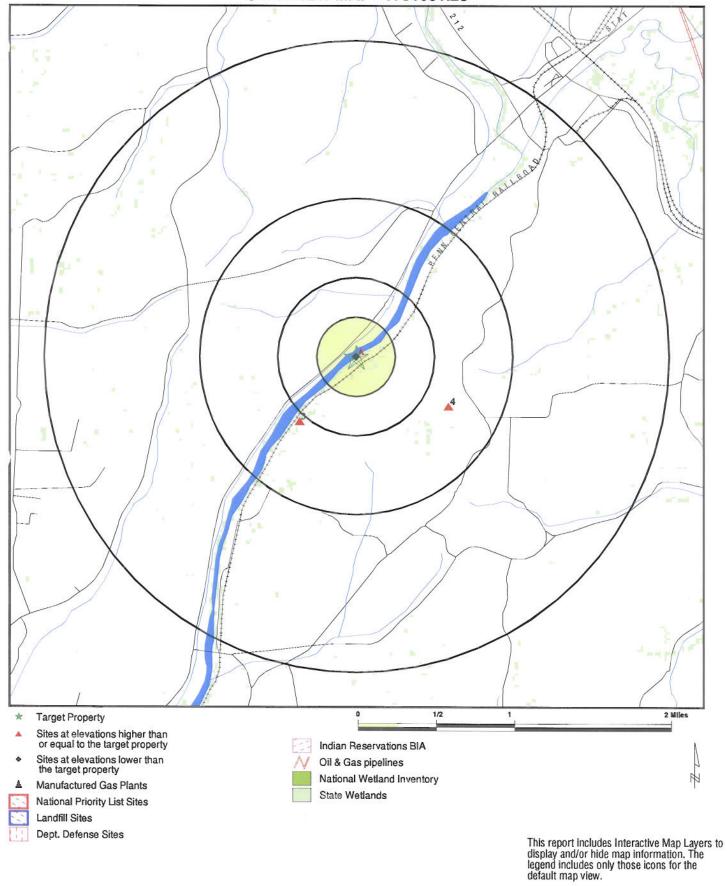
Equal/Higher Elevation	Address	Dist / Dir	Map ID	Page
TRIAD MINING INC		1/2 - 1 SW	3	6
DESSECKER COAL COMPANY		1/2 - 1 ESE	4	7

EXECUTIVE SUMMARY

Due to poor or inadequate address information, the following sites were not mapped:

Site Name	Database(s)
NEW PHILADELPHIA SLATER'S LANDFIL KIMBLE COAL CO MID-OHIO CONTRACTING INC EBERHART COAL INC HOLLOWAY TOOL, INC. MAUGHAN PROPERTY DOVER MACHINE CO BERNER TRUCKING INC G AND R EQUIPMENT INC INDUSTRIAL FINISHERS INC WASTE MANAGEMENT OF OHIO DOMOR DOVER CITY DOVER CHEM CORP DOVER CHEMICAL DOVER CHEMICAL CO CITY OF DOVER DOVER WWTP DOVER WWTP	Database(s) DERR, MSL DERR, CERC-NFRAP LUST LUST LUST RCRA-SQG, FINDS PADS, RCRA-SQG, FINDS RCRA-SQG, FINDS RCRA-SQG, FINDS RCRA-SQG, FINDS RCRA-SQG, FINDS RCRA-SQG, FINDS FINDS TSCA OH Spills OH Spills OH Spills OH Spills
DOVER WWTP DOVER WWTP	OH Spills OH Spills

OVERVIEW MAP - 1781681.2s



 SITE NAME:
 Dover Dam
 CLIENT:
 U.S. Army Corps of Engineers

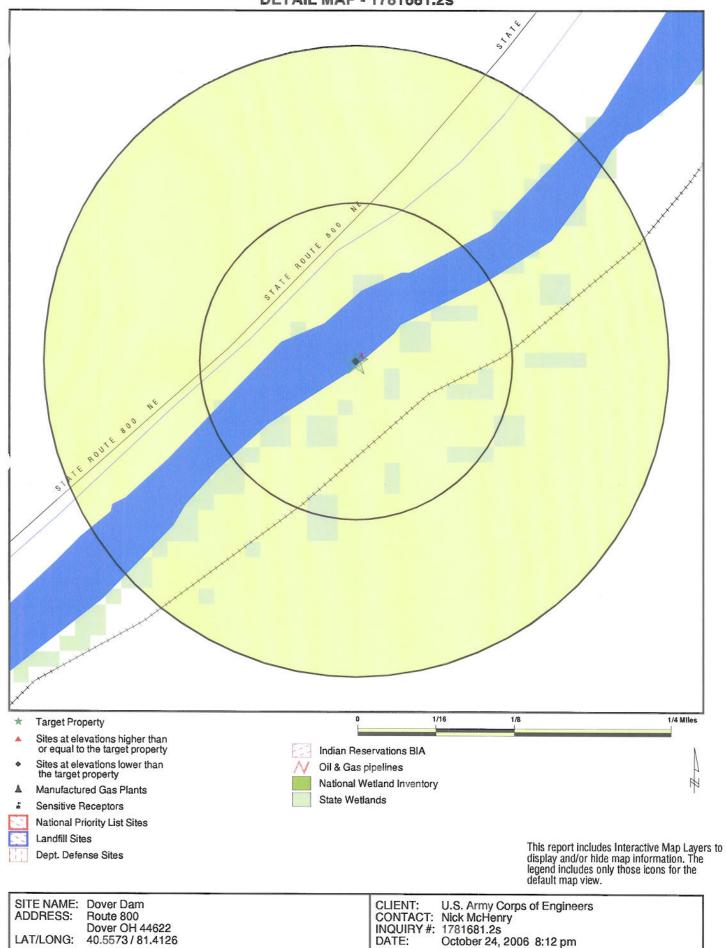
 ADDRESS:
 Route 800
 CONTACT:
 Nick McHenry

 Dover OH 44622
 INQUIRY #:
 1781681.2s

 LAT/LONG:
 40.5573 / 81.4126
 DATE:
 October 24, 2006 8:12 pm

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DETAIL MAP - 1781681.2s



MAP FINDINGS SUMMARY

Database	Target Property	Search Distance (Miles)	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
FEDERAL RECORDS								
NPL Proposed NPL Delisted NPL NPL RECOVERY CERCLIS CERC-NFRAP CORRACTS RCRA TSD RCRA Lg. Quan. Gen. RCRA Sm. Quan. Gen. ERNS HMIRS US ENG CONTROLS US INST CONTROL DOD FUDS US BROWNFIELDS CONSENT ROD UMTRA ODI TRIS TSCA FTTS SSTS ICIS PADS MLTS MINES FINDS PAATS	X	1.500 1.500 1.500 1.500 1.000 1.000 1.000 1.500 0.750 0.500 1.000 1.500 1.500 1.500 1.500 1.500 1.500 0.500	000000000000000000000000000000000000000			0 0 0 R 0 0 0 0 0 0 R R 0 0 0 0 0 0 0 0	000088808888888800800888888888888888888	000000000000000000000000000000000000000
RAATS		0.500	0	0	0	NR	NR	0
STATE AND LOCAL RECORD State Haz. Waste DERR TOWNGAS MSL State Landfill HIST LF LUST UNREG LTANKS UST ARCHIVE UST OH Spills ENG CONTROLS INST CONTROL VCP	<u>RDS</u> X	N/A 1.500 1.500 1.500 1.000 1.000 1.000 0.750 0.750 0.500 1.000 1.000	N/A 0 0 0 0 0 0 0 0	N/A 0 0 0 0 0 0 0	N/A 0 0 0 0 0 0 0	N/A 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	N/A 0 0 0 0 NR	N/A 0 0 0 0 0 0 0

MAP FINDINGS SUMMARY

Database	Target Property	Search Distance (Miles)	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
DRYCLEANERS		0.750	0	0	0	0	NR	0
BROWNFIELDS		1.000	0	0	0	0	NR	0
CDL		0.500	0	0	0	NR	NR	0
NPDES		0.500	0	0	0	NR	NR	0
USD		1.000	0	0	0	0	NR	0
HIST INST CONTROLS		1.000	0	0	0	0	NR	0
HIST ENG CONTROLS		1.000	0	0	0	0	NR	0
HIST USD		1.000	0	0	0	0	NR	0
TRIBAL RECORDS								
INDIAN RESERV		1.500	0	0	0	0	0	0
INDIAN LUST		1.000	0	0	0	0	NR	0
INDIAN UST		0.750	0	0	0	0	NR	0
EDR PROPRIETARY RECOR	RDS							
Manufactured Gas Plants		1.500	0	0	0	0	0	0

NOTES:

TP = Target Property

NR = Not Requested at this Search Distance

Sites may be listed in more than one database

N/A = This State does not maintain a SHWS list. See the Federal CERCLIS list.

Map ID Direction Distance Distance (ft.) Elevation

MAP FINDINGS

Database(s)

EDR ID Number EPA ID Number

A1 Target USACE DOVER DAM

FINDS

1007657942 110006264336

Property

5153 ST RTE 800 NE **DOVER, OH 44622**

Site 1 of 2 in cluster A

Actual: 865 ft.

FINDS:

Other Pertinent Environmental Activity Identified at Site

The OH-CORE (Ohio - Core) database contains information commonly shared among the Ohio EPA environmental programs. The information is facility-based, general in nature, and used to support specific programmatic systems while simultaneously maintaining an inventory of common facility-related data. Specific programmatic details are maintained in programmatic databases.

A2

DOVER DAM

LUST S104779625

Target

SR 800

N/A

MINES

M000083797

N/A

DOVER, OH 44622 Property

Site 2 of 2 in cluster A

Actual: 865 ft.

LUST:

Release Number: 79010060-N00001

LTF Status:

1 SUS/CON from regulated UST

FR Status:

NFA: No Further Action

Release Date:

Not reported Inactive

Facility Status:

Priority:

Review Date:

2000-06-20 00:00:00

3

SW 1/2-1

2872 ft.

TUSCARAWAS (County), OH

Relative: Higher

MINES:

Mine ID:

TRIAD MINING INC

3303672

SIC code(s): Actual: Entity name: 12110 00 0 00000 00000 00000 00000

967 ft. Company: ROEMER PIT

State FIPS code:

TRIAD MINING INC 39

County FIPS code:

157

Status:

D

Status date:

19870114

Operation Class:

Coal Mining

Number of shops: Number of plants: 0

Latitude:

0 40 33 05

Longitude:

081 25 10

Map ID Direction Distance Distance (ft.) MAP FINDINGS

Database(s)

MINES

EDR ID Number EPA ID Number

M000081171

N/A

4

DESSECKER COAL COMPANY

ESE

1/2-1

Elevation

TUSCARAWAS (County), OH

3523 ft.

Relative: Higher

MINES:

Mine ID:

3300900

SIC code(s):

Site

12110 00000 00000 00000 00000 00000

Actual: 1054 ft. Entity name:

DESSECKER

Company: State FIPS code:

DESSECKER COAL COMPANY 39

County FIPS code:

157

Status: Status date:

D 19810820

Operation Class: Number of shops: Coal Mining 0

Number of plants: Latitude: Longitude:

0 40 33 10

081 24 05

Zip Database(s)	44622 RCRA-SQG, FINDS	44622 RCRA-SQG, FINDS	44622 DERR, CERC-NFRAP	44622 RCRA-SQG, FINDS	44663 DERR, MSL	44622 LUST	44622 OH Spills		44622 RCRA-SQG, FINDS	44622 LUST	44622 PADS, RCRA-SQG, FINDS	44622 LUST	44622 FINDS	44622 LUST	OH Spills	44622 OH Spills	44622 OH Spills	44622 OH Spills	44622 OH Spills	44622 OH Spills
Site Address	RTE 2	ST RTE 800	ST RTE 39 RTE 1 BOX 401	STATE ROUTE 39	SR 39 ROUTE #1	RT 1	15TH / DAVIST	WEST 15TH & DAVIS ST	RD 2	RT 2 CR 80	RT 2 TWP RD 164	RT 3 YBX 303A	122 E 3RD ST	RT5	SR 516 / SR 39	CR 80 LIFT STATION	CR 80	CR 80 LIFT	CR 80	CR 80
Site Name	G AND R EQUIPMENT INC	INDUSTRIAL FINISHERS INC	KIMBLE COAL CO	WASTE MANAGEMENT OF OHIO DOMOR	NEW PHILADELPHIA SLATER'S LANDFIL	MID-OHIO CONTRACTING INC	DOVER CHEMICAL	DOVER CHEM CORP	DOVER MACHINE CO	EBERHART COAL INC	BERNER TRUCKING INC	HOLLOWAY TOOL, INC.	DOVER CITY	MAUGHAN PROPERTY	DOVER CHEMICAL CO	CITY OF DOVER	DOVER WWTP	DOVER WWTP	DOVER WWTP	DOVER WWTP
EDR ID	1000309731	1004764051	1003872131	1004763333	\$103686472	S104270911	\$106326075	1005927821	1000210842	1002990201	1000313040	S106409094	1008072417	S104270890	S105734822	S106963394	S106963370	\$106963299	S106963255	\$106963239
City	DOVER	DOVER	DOVER	DOVER	NEW PHILADELPHIA	DOVER	DOVER	DOVER	DOVER	DOVER	DOVER	DOVER	DOVER	DOVER	DOVER	DOVER	DOVER	DOVER	DOVER	DOVER

To maintain currency of the following federal and state databases, EDR contacts the appropriate governmental agency on a monthly or quarterly basis, as required.

Number of Days to Update: Provides confirmation that EDR is reporting records that have been updated within 90 days from the date the government agency made the information available to the public.

FEDERAL RECORDS

NPL: National Priority List

National Priorities List (Superfund). The NPL is a subset of CERCLIS and identifies over 1,200 sites for priority cleanup under the Superfund Program. NPL sites may encompass relatively large areas. As such, EDR provides polygon coverage for over 1,000 NPL site boundaries produced by EPA's Environmental Photographic Interpretation Center (EPIC) and regional EPA offices.

Date of Government Version: 07/05/2006 Date Data Arrived at EDR: 08/02/2006

Date Made Active in Reports: 09/12/2006

Number of Days to Update: 41

Source: EPA Telephone: N/A

Last EDR Contact: 08/02/2006

Next Scheduled EDR Contact: 10/30/2006 Data Release Frequency: Quarterly

NPL Site Boundaries

Sources:

EPA's Environmental Photographic Interpretation Center (EPIC)

Telephone: 202-564-7333

EPA Region 1

Telephone 617-918-1143

EPA Region 3 Telephone 215-814-5418

EPA Region 4 Telephone 404-562-8033

EPA Region 5

Telephone 312-886-6686

EPA Region 10

Telephone 206-553-8665

EPA Region 6 Telephone: 214-655-6659

EPA Region 7

Telephone: 913-551-7247

EPA Region 8

Telephone: 303-312-6774

EPA Region 9

Telephone: 415-947-4246

Proposed NPL: Proposed National Priority List Sites

Date of Government Version: 07/05/2006 Date Data Arrived at EDR: 08/02/2006 Date Made Active in Reports: 09/12/2006

Number of Days to Update: 41

Source: EPA Telephone: N/A

Last EDR Contact: 08/02/2006

Next Scheduled EDR Contact: 10/30/2006 Data Release Frequency: Quarterly

DELISTED NPL: National Priority List Deletions

The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establishes the criteria that the EPA uses to delete sites from the NPL. In accordance with 40 CFR 300.425.(e), sites may be deleted from the NPL where no further response is appropriate.

Date of Government Version: 07/05/2006 Date Data Arrived at EDR: 08/02/2006

Date Made Active in Reports: 09/12/2006

Number of Days to Update: 41

Source: EPA Telephone: N/A

Last EDR Contact: 08/02/2006

Next Scheduled EDR Contact: 10/30/2006 Data Release Frequency: Quarterly

NPL RECOVERY: Federal Superfund Liens

Federal Superfund Liens. Under the authority granted the USEPA by CERCLA of 1980, the USEPA has the authority to file liens against real property in order to recover remedial action expenditures or when the property owner received notification of potential liability. USEPA compiles a listing of filed notices of Superfund Liens.

Date of Government Version: 10/15/1991 Date Data Arrived at FDR: 02/02/1994 Date Made Active in Reports: 03/30/1994

Number of Days to Update: 56

Source: EPA

Telephone: 202-564-4267 Last EDR Contact: 08/21/2006

Next Scheduled EDR Contact: 11/20/2006 Data Release Frequency: No Update Planned

CERCLIS: Comprehensive Environmental Response, Compensation, and Liability Information System

CERCLIS contains data on potentially hazardous waste sites that have been reported to the USEPA by states, municipalities, private companies and private persons, pursuant to Section 103 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). CERCLIS contains sites which are either proposed to or on the National Priorities List (NPL) and sites which are in the screening and assessment phase for possible inclusion on the NPL.

Date of Government Version: 06/19/2006 Date Data Arrived at EDR: 06/22/2006 Date Made Active in Reports: 08/23/2006 Number of Days to Update: 62

Source: EPA Telephone: 703-603-8960 Last EDR Contact: 09/21/2006

Next Scheduled EDR Contact: 12/18/2006 Data Release Frequency: Quarterly

CERCLIS-NFRAP: CERCLIS No Further Remedial Action Planned

Archived sites are sites that have been removed and archived from the inventory of CERCLIS sites. Archived status indicates that, to the best of EPA's knowledge, assessment at a site has been completed and that EPA has determined no further steps will be taken to list this site on the National Priorities List (NPL), unless information indicates this decision was not appropriate or other considerations require a recommendation for listing at a later time. This decision does not necessarily mean that there is no hazard associated with a given site; it only means that, based upon available information, the location is not judged to be a potential NPL site.

Date of Government Version: 07/17/2006 Date Data Arrived at EDR: 08/02/2006 Date Made Active in Reports: 09/12/2006

Number of Days to Update: 41

Source: EPA

Telephone: 703-603-8960 Last EDR Contact: 09/18/2006

Next Scheduled EDR Contact: 12/18/2006 Data Release Frequency: Quarterly

CORRACTS: Corrective Action Report

CORRACTS identifies hazardous waste handlers with RCRA corrective action activity.

Date of Government Version: 03/15/2006 Date Data Arrived at EDR: 03/17/2006 Date Made Active in Reports: 04/13/2006

Number of Days to Update: 27

Source: EPA

Telephone: 800-424-9346 Last EDR Contact: 09/05/2006

Next Scheduled EDR Contact: 12/04/2006 Data Release Frequency: Quarterly

RCRA: Resource Conservation and Recovery Act Information

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. RCRAInfo replaces the data recording and reporting abilities of the Resource Conservation and Recovery Information System (RCRIS). The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Conditionally exempt small quantity generators (CESQGs) generate less than 100 kg of hazardous waste, or less than 1 kg of acutely hazardous waste per month. Small quantity generators (SQGs) generate between 100 kg and 1,000 kg of hazardous waste per month. Large quantity generators (LQGs) generate over 1,000 kilograms (kg) of hazardous waste, or over 1 kg of acutely hazardous waste per month. Transporters are individuals or entities that move hazardous waste from the generator off-site to a facility that can recycle, treat, store, or dispose of the waste. TSDFs treat, store, or dispose of the waste.

Date of Government Version: 06/13/2006 Date Data Arrived at EDR: 06/28/2006 Date Made Active in Reports: 08/23/2006

Number of Days to Update: 56

Source: EPA

Telephone: 800-424-9346 Last EDR Contact: 09/28/2006

Next Scheduled EDR Contact: 11/20/2006 Data Release Frequency: Quarterly

ERNS: Emergency Response Notification System

Emergency Response Notification System. ERNS records and stores information on reported releases of oil and hazardous substances.

Date of Government Version: 12/31/2005 Date Data Arrived at EDR: 01/12/2006 Date Made Active in Reports: 02/21/2006

Number of Days to Update: 40

Source: National Response Center, United States Coast Guard

Telephone: 202-260-2342 Last EDR Contact: 10/24/2006

Next Scheduled EDR Contact: 01/22/2007 Data Release Frequency: Annually

HMIRS: Hazardous Materials Information Reporting System

Hazardous Materials Incident Report System. HMIRS contains hazardous material spill incidents reported to DOT.

Date of Government Version: 07/03/2006 Date Data Arrived at EDR: 07/19/2006 Date Made Active in Reports: 08/23/2006

Number of Days to Update: 35

Source: U.S. Department of Transportation

Telephone: 202-366-4555 Last EDR Contact: 10/18/2006

Next Scheduled EDR Contact: 01/15/2007 Data Release Frequency: Annually

US ENG CONTROLS: Engineering Controls Sites List

A listing of sites with engineering controls in place. Engineering controls include various forms of caps, building foundations, liners, and treatment methods to create pathway elimination for regulated substances to enter environmental media or effect human health.

Date of Government Version: 03/21/2006 Date Data Arrived at EDR: 03/27/2006 Date Made Active in Reports: 05/22/2006

Number of Days to Update: 56

Source: Environmental Protection Agency

Telephone: 703-603-8905 Last EDR Contact: 09/07/2006

Next Scheduled EDR Contact: 10/02/2006 Data Release Frequency: Varies

US INST CONTROL: Sites with Institutional Controls

A listing of sites with institutional controls in place. Institutional controls include administrative measures, such as groundwater use restrictions, construction restrictions, property use restrictions, and post remediation care requirements intended to prevent exposure to contaminants remaining on site. Deed restrictions are generally required as part of the institutional controls.

Date of Government Version: 03/21/2006 Date Data Arrived at EDR: 03/27/2006 Date Made Active in Reports: 05/22/2006 Number of Days to Update: 56

Source: Environmental Protection Agency

Telephone: 703-603-8905 Last EDR Contact: 09/07/2006

Next Scheduled EDR Contact: 10/02/2006 Data Release Frequency: Varies

DOD: Department of Defense Sites

This data set consists of federally owned or administered lands, administered by the Department of Defense, that have any area equal to or greater than 640 acres of the United States, Puerto Rico, and the U.S. Virgin Islands.

Date of Government Version: 12/31/2004 Date Data Arrived at EDR: 02/08/2005 Date Made Active in Reports: 08/04/2005

Number of Days to Update: 177

Source: USGS

Telephone: 703-692-8801 Last EDR Contact: 08/11/2006

Next Scheduled EDR Contact: 11/06/2006 Data Release Frequency: Semi-Annually

FUDS: Formerly Used Defense Sites

The listing includes locations of Formerly Used Defense Sites properties where the US Army Corps of Engineers is actively working or will take necessary cleanup actions.

Date of Government Version: 12/05/2005 Date Data Arrived at EDR: 01/19/2006 Date Made Active in Reports: 02/21/2006

Number of Days to Update: 33

Source: U.S. Army Corps of Engineers

Telephone: 202-528-4285 Last EDR Contact: 09/18/2006

Next Scheduled EDR Contact: 01/01/2007 Data Release Frequency: Varies

US BROWNFIELDS: A Listing of Brownfields Sites

Included in the listing are brownfields properties addresses by Cooperative Agreement Recipients and brownfields properties addressed by Targeted Brownfields Assessments. Targeted Brownfields Assessments-EPA's Targeted Brownfields Assessments (TBA) program is designed to help states, tribes, and municipalities--especially those without EPA Brownfields Assessment Demonstration Pilots-minimize the uncertainties of contamination often associated with brownfields. Under the TBA program, EPA provides funding and/or technical assistance for environmental assessments at brownfields sites throughout the country. Targeted Brownfields Assessments supplement and work with other efforts under EPA's Brownfields Initiative to promote cleanup and redevelopment of brownfields. Cooperative Agreement Recipients-States, political subdivisions, territories, and Indian tribes become Brownfields Cleanup Revolving Loan Fund (BCRLF) cooperative agreement recipients when they enter into BCRLF cooperative agreements with the U.S. EPA. EPA selects BCRLF cooperative agreement recipients based on a proposal and application process, BCRLF cooperative agreement recipients must use EPA funds provided through BCRLF cooperative agreement for specified brownfields-related cleanup activities.

Date of Government Version: 07/10/2006 Date Data Arrived at EDR: 07/13/2006 Date Made Active in Reports: 09/06/2006 Number of Days to Update: 55

Source: Environmental Protection Agency Telephone: 202-566-2777

Last EDR Contact: 09/11/2006

Next Scheduled EDR Contact: 12/11/2006 Data Release Frequency: Semi-Annually

CONSENT: Superfund (CERCLA) Consent Decrees

Major legal settlements that establish responsibility and standards for cleanup at NPL (Superfund) sites. Released periodically by United States District Courts after settlement by parties to litigation matters.

Date of Government Version: 12/14/2004 Date Data Arrived at EDR: 02/15/2005 Date Made Active in Reports: 04/25/2005

Number of Days to Update: 69

Source: Department of Justice, Consent Decree Library

Telephone: Varies

Last EDR Contact: 10/23/2006

Next Scheduled EDR Contact: 01/22/2007 Data Release Frequency: Varies

ROD: Records Of Decision

Record of Decision. ROD documents mandate a permanent remedy at an NPL (Superfund) site containing technical and health information to aid in the cleanup.

Date of Government Version: 07/10/2006 Date Data Arrived at EDR: 07/21/2006 Date Made Active in Reports: 09/06/2006 Number of Days to Update: 47

Source: EPA

Telephone: 703-416-0223 Last EDR Contact: 10/02/2006

Next Scheduled EDR Contact: 01/01/2007 Data Release Frequency: Annually

UMTRA: Uranium Mill Tailings Sites

Uranium ore was mined by private companies for federal government use in national defense programs. When the mills shut down, large piles of the sand-like material (mill tailings) remain after uranium has been extracted from the ore. Levels of human exposure to radioactive materials from the piles are low; however, in some cases tailings were used as construction materials before the potential health hazards of the tailings were recognized.

Date of Government Version: 11/04/2005 Date Data Arrived at EDR: 11/28/2005 Date Made Active in Reports: 01/30/2006

Number of Days to Update: 63

Source: Department of Energy Telephone: 505-845-0011 Last EDR Contact: 09/05/2006

Next Scheduled EDR Contact: 12/18/2006 Data Release Frequency: Varies

ODI: Open Dump Inventory

An open dump is defined as a disposal facility that does not comply with one or more of the Part 257 or Part 258 Subtitle D Criteria.

Date of Government Version: 06/30/1985 Date Data Arrived at EDR: 08/09/2004 Date Made Active in Reports: 09/17/2004 Number of Days to Update: 39

Source: Environmental Protection Agency Telephone: 800-424-9346 Last EDR Contact: 06/09/2004 Next Scheduled EDR Contact: N/A

Data Release Frequency: No Update Planned

PRP: Potentially Responsible Parties

A listing of verified Potentially Responsible Parties

Date of Government Version: 07/20/2006 Date Data Arrived at EDR: 07/21/2006 Date Made Active in Reports: 08/22/2006

Source: EPA

Telephone: 202-564-6064 Last EDR Contact: 10/02/2006

Number of Days to Update: 32

Next Scheduled EDR Contact: 01/01/2007 Data Release Frequency: Quarterly

TRIS: Toxic Chemical Release Inventory System

Toxic Release Inventory System. TRIS identifies facilities which release toxic chemicals to the air, water and land in reportable quantities under SARA Title III Section 313.

Date of Government Version: 12/31/2004 Date Data Arrived at EDR: 06/22/2006 Date Made Active in Reports: 08/23/2006

Number of Days to Update: 62

Source: EPA

Telephone: 202-566-0250 Last EDR Contact: 09/22/2006

Next Scheduled EDR Contact: 12/18/2006 Data Release Frequency: Annually

TSCA: Toxic Substances Control Act

Toxic Substances Control Act. TSCA identifies manufacturers and importers of chemical substances included on the TSCA Chemical Substance Inventory list. It includes data on the production volume of these substances by plant

Date of Government Version: 12/31/2002 Date Data Arrived at EDR: 04/14/2006 Date Made Active in Reports: 05/30/2006

Number of Days to Update: 46

Source: EPA

Telephone: 202-260-5521 Last EDR Contact: 10/18/2006

Next Scheduled EDR Contact: 01/15/2007 Data Release Frequency: Every 4 Years

FTTS: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act) FTTS tracks administrative cases and pesticide enforcement actions and compliance activities related to FIFRA, TSCA and EPCRA (Emergency Planning and Community Right-to-Know Act). To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 07/14/2006 Date Data Arrived at EDR: 07/18/2006 Date Made Active in Reports: 09/06/2006 Number of Days to Update: 50

Source: EPA/Office of Prevention, Pesticides and Toxic Substances Telephone: 202-566-1667

Last EDR Contact: 09/18/2006

Next Scheduled EDR Contact: 12/18/2006 Data Release Frequency: Quarterly

FTTS INSP: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)

Date of Government Version: 07/14/2006 Date Data Arrived at EDR: 07/18/2006 Date Made Active in Reports: 09/06/2006

Number of Days to Update: 50

Source: EPA

Telephone: 202-566-1667 Last EDR Contact: 09/18/2006

Next Scheduled EDR Contact: 12/18/2006 Data Release Frequency: Quarterly

SSTS: Section 7 Tracking Systems

Section 7 of the Federal Insecticide, Fungicide and Rodenticide Act, as amended (92 Stat. 829) requires all registered pesticide-producing establishments to submit a report to the Environmental Protection Agency by March 1st each year. Each establishment must report the types and amounts of pesticides, active ingredients and devices being produced, and those having been produced and sold or distributed in the past year.

Date of Government Version: 12/31/2004 Date Data Arrived at EDR: 05/11/2006 Date Made Active in Reports: 05/22/2006

Number of Days to Update: 11

Source: EPA

Telephone: 202-564-4203 Last EDR Contact: 10/16/2006

Next Scheduled EDR Contact: 01/15/2007 Data Release Frequency: Annually

ICIS: Integrated Compliance Information System

The Integrated Compliance Information System (ICIS) supports the information needs of the national enforcement and compliance program as well as the unique needs of the National Pollutant Discharge Elimination System (NPDES) program.

Date of Government Version: 02/13/2006 Date Data Arrived at EDR: 04/21/2006 Date Made Active in Reports: 05/11/2006

Number of Days to Update: 20

Source: Environmental Protection Agency

Telephone: 202-564-5088 Last EDR Contact: 07/17/2006

Next Scheduled EDR Contact: 10/16/2006 Data Release Frequency: Quarterly

PADS: PCB Activity Database System

PCB Activity Database. PADS Identifies generators, transporters, commercial storers and/or brokers and disposers of PCB's who are required to notify the EPA of such activities.

Date of Government Version: 07/07/2006 Date Data Arrived at EDR: 08/09/2006 Date Made Active in Reports: 09/06/2006

Number of Days to Update: 28

Source: EPA

Telephone: 202-566-0500 Last EDR Contact: 08/09/2006

Next Scheduled EDR Contact: 11/06/2006 Data Release Frequency: Annually

MLTS: Material Licensing Tracking System

MLTS is maintained by the Nuclear Regulatory Commission and contains a list of approximately 8,100 sites which possess or use radioactive materials and which are subject to NRC licensing requirements. To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 07/10/2006 Date Data Arrived at EDR: 07/20/2006 Date Made Active in Reports: 09/06/2006

Number of Days to Update: 48

Source: Nuclear Regulatory Commission

Telephone: 301-415-7169 Last EDR Contact: 10/02/2006

Next Scheduled EDR Contact: 01/01/2007 Data Release Frequency: Quarterly

MINES: Mines Master Index File

Contains all mine identification numbers issued for mines active or opened since 1971. The data also includes violation information.

Date of Government Version: 05/16/2006 Date Data Arrived at FDR: 06/28/2006 Date Made Active in Reports: 08/23/2006

Number of Days to Update: 56

Source: Department of Labor, Mine Safety and Health Administration

Telephone: 303-231-5959 Last EDR Contact: 09/27/2006

Next Scheduled EDR Contact: 12/25/2006 Data Release Frequency: Semi-Annually

FINDS: Facility Index System/Facility Registry System

Facility Index System. FINDS contains both facility information and 'pointers' to other sources that contain more detail. EDR includes the following FINDS databases in this report: PCS (Permit Compliance System), AIRS (Aerometric Information Retrieval System), DOCKET (Enforcement Docket used to manage and track information on civil judicial enforcement cases for all environmental statutes), FURS (Federal Underground Injection Control), C-DOCKET (Criminal Docket System used to track criminal enforcement actions for all environmental statutes), FFIS (Federal Facilities Information System), STATE (State Environmental Laws and Statutes), and PADS (PCB Activity Data System).

Date of Government Version: 07/21/2006 Date Data Arrived at EDR: 07/25/2006 Date Made Active in Reports: 09/06/2006

Number of Days to Update: 43

Source: EPA Telephone: N/A

Last EDR Contact: 10/02/2006

Next Scheduled EDR Contact: 01/01/2007 Data Release Frequency: Quarterly

RAATS: RCRA Administrative Action Tracking System

RCRA Administration Action Tracking System. RAATS contains records based on enforcement actions issued under RCRA pertaining to major violators and includes administrative and civil actions brought by the EPA. For administration actions after September 30, 1995, data entry in the RAATS database was discontinued. EPA will retain a copy of the database for historical records. It was necessary to terminate RAATS because a decrease in agency resources made it impossible to continue to update the information contained in the database.

Date of Government Version: 04/17/1995 Date Data Arrived at EDR: 07/03/1995 Date Made Active in Reports: 08/07/1995

Number of Days to Update: 35

Source: EPA

Telephone: 202-564-4104 Last EDR Contact: 09/05/2006

Next Scheduled EDR Contact: 12/04/2006 Data Release Frequency: No Update Planned

BRS: Biennial Reporting System

The Biennial Reporting System is a national system administered by the EPA that collects data on the generation and management of hazardous waste. BRS captures detailed data from two groups: Large Quantity Generators (LQG) and Treatment, Storage, and Disposal Facilities.

Date of Government Version: 12/31/2003 Date Data Arrived at EDR: 06/17/2005 Date Made Active in Reports: 08/04/2005

Number of Days to Update: 48

Source: EPA/NTIS Telephone: 800-424-9346 Last EDR Contact: 10/20/2006

Next Scheduled EDR Contact: 12/11/2006 Data Release Frequency: Biennially

STATE AND LOCAL RECORDS

SHWS: This state does not maintain a SHWS list. See the Federal CERCLIS list and Federal NPL list.

State Hazardous Waste Sites. State hazardous waste site records are the states' equivalent to CERCLIS. These sites may or may not already be listed on the federal CERCLIS list. Priority sites planned for cleanup using state funds (state equivalent of Superfund) are identified along with sites where cleanup will be paid for by potentially responsible parties. Available information varies by state.

Date of Government Version: N/A Date Data Arrived at EDR: N/A Date Made Active in Reports: N/A Number of Days to Update: N/A

Source: Ohio EPA Telephone: 614-644-2924 Last EDR Contact: 09/05/2006 Next Scheduled EDR Contact: 12/04/2006

Data Release Frequency: N/A

DERR: Division of Emergency & Remedial Response's Database

The DERR listings contains sites from all of Ohio that are in the Division of Emergency and Remedial Response (DERR) database, which is an index of sites for which our district offices maintain files. The database is NOT a record of contaminated sites or sites suspected of contamination. Not all sites in the database are contaminated, and a site's absence from the database does not imply that it is uncontaminated.

Date of Government Version: 09/12/2006 Date Data Arrived at EDR: 09/13/2006 Date Made Active in Reports: 09/25/2006 Number of Days to Update: 12

Source: Ohio EPA, Div. of Emergency and Remedial Response

Telephone: 614-644-3538 Last EDR Contact: 09/11/2006

Next Scheduled EDR Contact: 12/11/2006 Data Release Frequency: Semi-Annually

TOWNGAS: DERR Towngas Database

The database includes 82 very old sites (circa 1895) which produced gas from coal for street lighting. Most visual evidence of these sites has disappeared, however the potential for buried coal tar remains. The database is no longer in active use.

Date of Government Version: 07/28/1992 Date Data Arrived at EDR: 02/21/2003 Date Made Active in Reports: 03/05/2003

Number of Days to Update: 12

Source: Ohio EPA Telephone: 614-644-3749 Last EDR Contact: 02/12/2003 Next Scheduled EDR Contact: N/A

Data Release Frequency: No Update Planned

MSL: Master Sites List

Ohio EPA no longer maintains or publishes the MSL, which was a list of sites with known or suspected contamination. Please be advised that this report does not constitute a determination that any site identified in the report is or may be contaminated.

Date of Government Version: 03/01/1999 Date Data Arrived at EDR: 03/29/1999 Date Made Active in Reports: 04/21/1999

Number of Days to Update: 23

Source: Ohio Environmental Protection Agency

Telephone: 614-644-2068 Last EDR Contact: 09/05/2006

Next Scheduled EDR Contact: 12/04/2006 Data Release Frequency: No Update Planned

SWF/LF: Licensed Solid Waste Facilities

Solid Waste Facilities/Landfill Sites. SWF/LF type records typically contain an inventory of solid waste disposal facilities or landfills in a particular state. Depending on the state, these may be active or inactive facilities or open dumps that failed to meet RCRA Subtitle D Section 4004 criteria for solid waste landfills or disposal

Date of Government Version: 08/18/2006 Date Data Arrived at EDR: 08/18/2006 Date Made Active in Reports: 09/25/2006

Number of Days to Update: 38

Source: Ohio Environmental Protection Agency

Telephone: 614-644-2621 Last EDR Contact: 08/07/2006

Next Scheduled EDR Contact: 11/06/2006 Data Release Frequency: Annually

HIST LF: Old Solid Waste Landfill

A list of about 1200 old abandoned dumps or landfills. This database was developed from Ohio EPA staff notebooks and other information dating from the mid-1970s

Date of Government Version: 01/01/1980 Date Data Arrived at EDR: 07/01/2003 Date Made Active in Reports: 07/17/2003

Number of Days to Update: 16

Source: Ohio EPA Telephone: 614-644-3749 Last EDR Contact: 06/26/2003 Next Scheduled EDR Contact: N/A

Data Release Frequency: No Update Planned

LUST: Leaking Underground Storage Tank File

Leaking Underground Storage Tank Incident Reports. LUST records contain an inventory of reported leaking underground storage tank incidents. Not all states maintain these records, and the information stored varies by state.

Date of Government Version: 09/13/2006 Date Data Arrived at EDR: 09/14/2006 Date Made Active in Reports: 09/25/2006

Number of Days to Update: 11

Source: Department of Commerce Telephone: 614-752-7924 Last EDR Contact: 09/14/2006

Next Scheduled EDR Contact: 12/11/2006 Data Release Frequency: Quarterly

UNREG LTANKS: Ohio Leaking UST File

A suspected or confirmed release of petroleum from a non-regulated UST.

Date of Government Version: 08/25/1999 Date Data Arrived at EDR: 08/19/2003 Date Made Active in Reports: 08/26/2003 Number of Days to Update: 7

Source: Department of Commerce Telephone: 614-752-7938 Last EDR Contact: 08/01/2003 Next Scheduled EDR Contact: N/A

Data Release Frequency: No Update Planned

UST: Underground Storage Tank Tank File

Registered Underground Storage Tanks. UST's are regulated under Subtitle I of the Resource Conservation and Recovery Act (RCRA) and must be registered with the state department responsible for administering the UST program. Available information varies by state program.

Date of Government Version: 09/13/2006 Date Data Arrived at EDR: 09/14/2006 Date Made Active in Reports: 10/19/2006

Number of Days to Update: 35

Source: Department of Commerce Telephone: 614-752-7938 Last EDR Contact: 09/14/2006

Next Scheduled EDR Contact: 12/11/2006 Data Release Frequency: Quarterly

ARCHIVE UST: Archived Underground Storage Tank Sites

Underground storage tank records that have been removed from the Underground Storage Tank database.

Date of Government Version: 09/13/2006 Date Data Arrived at EDR: 09/14/2006 Date Made Active in Reports: 10/19/2006

Number of Days to Update: 35

Source: Department of Commerce, Division of State Fire Marshal

Telephone: 614-752-7938 Last EDR Contact: 09/14/2006

Next Scheduled EDR Contact: 12/11/2006 Data Release Frequency: Quarterly

SPILLS: Emergency Response Database

Incidents reported to the Emergency Response Unit. The focus of the ER program is to minimize the impact on the environment from accidental releases, spills, and unauthorized discharges from any fixed or mobile sources. Incidents involving petroleum products, hazardous materials, hazardous waste, abandoned drums, or other materials which may pose as a pollution threat to the state?s water, land, or air should be reported immediately. Not all incidents included in the database are actual SPILLS, they can simply be reported incidents.

Date of Government Version: 09/06/2006 Date Data Arrived at EDR: 09/08/2006 Date Made Active in Reports: 09/25/2006

Number of Days to Update: 17

Source: Ohio EPA Telephone: 614-644-2084 Last EDR Contact: 09/05/2006

Next Scheduled EDR Contact: 12/04/2006 Data Release Frequency: Varies

ENG CONTROLS: Sites with Engineering Controls

A database that tracks properties with engineering controls.

Date of Government Version: 09/05/2006 Date Data Arrived at EDR: 09/18/2006 Date Made Active in Reports: 10/19/2006

Number of Days to Update: 31

Source: Ohio EPA Telephone: 614-644-2324 Last EDR Contact: 09/05/2006

Next Scheduled EDR Contact: 12/04/2006 Data Release Frequency: Semi-Annually

INST CONTROL: Sites with Institutional Engineering Controls A database that tracks properties with institutional controls.

Date of Government Version: 09/05/2006 Date Data Arrived at EDR: 09/18/2006 Date Made Active in Reports: 10/19/2006

Number of Days to Update: 31

Source: Ohio Environmental Protection Agency

Telephone: 614-644-2324 Last EDR Contact: 09/05/2006

Next Scheduled EDR Contact: 12/04/2006 Data Release Frequency: Semi-Annually

VCP: Voluntary Action Program Sites

Site involved in the Voluntary Action Program.

Date of Government Version: 09/05/2006 Date Data Arrived at EDR: 09/06/2006 Date Made Active in Reports: 09/25/2006

Number of Days to Update: 19

Source: Ohio EPA, Voluntary Action Program

Telephone: 614-644-1298 Last EDR Contact: 09/05/2006

Next Scheduled EDR Contact: 12/04/2006 Data Release Frequency: Semi-Annually

DRYCLEANERS: Drycleaner Facility Listing

A listing of drycleaner facility locations.

Date of Government Version: 08/18/2006 Date Data Arrived at EDR: 08/23/2006 Date Made Active in Reports: 09/25/2006

Number of Days to Update: 33

Source: Ohio EPA Telephone: 614-644-3469 Last EDR Contact: 10/23/2006

Next Scheduled EDR Contact: 01/22/2007 Data Release Frequency: Varies

BROWNFIELDS: Ohio Brownfield Inventory

A statewide brownfields inventory. A brownfield is an abandoned, idled or under-used industrial or commercial property where expansion or redevelopment is complicated by known or potential releases of hazardous substances and/or petroleum.

Date of Government Version: 07/12/2006 Date Data Arrived at EDR: 08/07/2006 Date Made Active in Reports: 09/25/2006

Number of Days to Update: 49

Source: Ohio EPA Telephone: 614-644-3748 Last EDR Contact: 10/12/2006

Next Scheduled EDR Contact: 01/08/2007 Data Release Frequency: Varies

CDL: Clandestine Drug Lab Locations

A list of clandestine drug lab sites with environmental impact. This list is extracted from the SPILLS database based on the "product" type.

Date of Government Version: 03/22/2006 Date Data Arrived at EDR: 04/10/2006 Date Made Active in Reports: 05/04/2006

Number of Days to Update: 24

Source: Ohio EPA Telephone: 614-644-2080 Last EDR Contact: 09/05/2006

Next Scheduled EDR Contact: 12/04/2006 Data Release Frequency: Varies

NPDES: NPDES General Permit List

General information regarding NPDES (National Pollutant Discharge Elimination System) permits.

Date of Government Version: 08/15/2006 Date Data Arrived at EDR: 09/08/2006 Date Made Active in Reports: 09/25/2006

Number of Days to Update: 17

Source: Ohio EPA Telephone: 614-644-2031 Last EDR Contact: 09/08/2006

Next Scheduled EDR Contact: 12/04/2006 Data Release Frequency: Semi-Annually

USD: Urban Setting Designation Sites

A USD may be requested for properties participating in the VAP when there is no current or future use of the ground water by local residents for drinking, showering, bathing or cooking. In these areas, an approved USD would lower the cost of cleanup and promote economic redevelopment while still protecting public health and safety. If these USDs were to be approved, the ground water cleanup or response requirements for the areas could be lessened. The Ohio EPA director may approve a USD request based on a demonstration that the USD requirements are met and an evaluation of existing and future uses of ground water in the area. The Ohio EPA director's decision on approval or denial of the request is needed before cleanup requirements for the site can be determined.

Date of Government Version: 08/30/2006 Date Data Arrived at EDR: 09/18/2006 Date Made Active in Reports: 10/19/2006

Number of Days to Update: 31

Source: Ohio EPA Telephone: 614-644-3749 Last EDR Contact: 09/06/2006

Next Scheduled EDR Contact: 12/04/2006 Data Release Frequency: Varies

HIST INST CONTROLS: Institutional Controls Database

"Institutional control" is a restriction that is recorded in the same manner as a deed which limits access to or use of the property such that exposure to hazardous substances or petroleum are effectively and reliably eliminated or mitigated. Examples of institutional controls include land and water use restrictions. This database is no longer updated or maintained by the state agency.

Date of Government Version: 05/10/2005 Date Data Arrived at EDR: 04/06/2006 Date Made Active in Reports: 05/04/2006

Number of Days to Update: 28

Source: Ohio EPA Telephone: 614-644-3749 Last EDR Contact: 09/05/2006

Next Scheduled EDR Contact: 12/04/2006 Data Release Frequency: No Update Planned

HIST USD: Urban Setting Designations Database

A USD may be requested for properties participating in the VAP when there is no current or future use of the ground water by local residents for drinking, showering, bathing or cooking. In these areas, an approved USD would lower the cost of cleanup and promote economic redevelopment while still protecting public health and safety. If these USDs were to be approved, the ground water cleanup or response requirements for the areas could be lessened. The Ohio EPA director may approve a USD request based on a demonstration that the USD requirements are met and an evaluation of existing and future uses of ground water in the area. The Ohio EPA director's decision on approval or denial of the request is needed before cleanup requirements for the site can be determined. This database is no longer updated or maintained by the state agency.

Date of Government Version: 05/10/2005 Date Data Arrived at EDR: 04/25/2006 Date Made Active in Reports: 05/11/2006

Number of Days to Update: 16

Source: Ohio EPA Telephone: 614-644-3749 Last EDR Contact: 09/05/2006

Next Scheduled EDR Contact: 12/04/2006 Data Release Frequency: No Update Planned

HIST ENG CONTROLS: Operation & Maintenance Agreements Database

Volunteers that complete a voluntary action that relies on the ongoing operation and maintenance (O&M) of an engineered control to make the site protective (e.g" cap systems and ground water treatment systems) must enter into a legally binding agreement with the Ohio EPA before the director issues a covenant not to sue. This O&M Agreement must describe how the remedy is constructed and how itwill be monitored, maintained and repaired. It also lays out inspection opportunities for the agency. Companies must document that they have the financial capability to operate any remedy relied on, before the agency will agree to enter into the O&M Agreement. The statute requires that the agency be notified of any change in ownership. This database is no longer updated or maintained by the state agency.

Date of Government Version: 05/10/2005 Date Data Arrived at EDR: 04/04/2006 Date Made Active in Reports: 05/04/2006

Number of Days to Update: 30

Source: Ohio EPA Telephone: 614-644-3749 Last EDR Contact: 09/05/2006

Next Scheduled EDR Contact: 12/04/2006 Data Release Frequency: No Update Planned

TRIBAL RECORDS

INDIAN RESERV: Indian Reservations

This map layer portrays Indian administered lands of the United States that have any area equal to or greater than 640 acres.

Date of Government Version: 12/31/2004 Date Data Arrived at EDR: 02/08/2005 Date Made Active in Reports: 08/04/2005

Number of Days to Update: 177

Source: USGS

Telephone: 202-208-3710 Last EDR Contact: 08/11/2006

Next Scheduled EDR Contact: 11/06/2006 Data Release Frequency: Semi-Annually

INDIAN LUST R1: Leaking Underground Storage Tanks on Indian Land A listing of leaking underground storage tank locations on Indian Land.

Date of Government Version: 06/08/2006 Date Data Arrived at EDR: 06/09/2006 Date Made Active in Reports: 06/28/2006 Number of Days to Update: 19 Source: EPA Region 1 Telephone: 617-918-1313 Last EDR Contact: 08/21/2006

Next Scheduled EDR Contact: 11/20/2006 Data Release Frequency: Varies

INDIAN LUST R8: Leaking Underground Storage Tanks on Indian Land

LUSTs on Indian land in Colorado, Montana, North Dakota, South Dakota, Utah and Wyoming.

Date of Government Version: 06/06/2006 Date Data Arrived at EDR: 06/09/2006 Date Made Active in Reports: 07/28/2006

Number of Days to Update: 49

Source: EPA Region 8 Telephone: 303-312-6271 Last EDR Contact: 08/21/2006

Next Scheduled EDR Contact: 11/20/2006 Data Release Frequency: Quarterly

INDIAN LUST R10: Leaking Underground Storage Tanks on Indian Land LUSTs on Indian land in Alaska, Idaho, Oregon and Washington.

Date of Government Version: 06/08/2006 Date Data Arrived at EDR: 06/09/2006 Date Made Active in Reports: 07/28/2006

Number of Days to Update: 49

Source: EPA Region 10 Telephone: 206-553-2857 Last EDR Contact: 08/21/2006

Next Scheduled EDR Contact: 11/20/2006 Data Release Frequency: Quarterly

INDIAN LUST R9: Leaking Underground Storage Tanks on Indian Land LUSTs on Indian land in Arizona, California, New Mexico and Nevada

Date of Government Version: 06/01/2006 Date Data Arrived at EDR: 06/23/2006 Date Made Active in Reports: 08/02/2006

Number of Days to Update: 40

Source: Environmental Protection Agency Telephone: 415-972-3372 Last EDR Contact: 08/21/2006

Next Scheduled EDR Contact: 11/20/2006 Data Release Frequency: Quarterly

INDIAN LUST R7: Leaking Underground Storage Tanks on Indian Land LUSTs on Indian land in Iowa, Kansas, and Nebraska

Date of Government Version: 06/01/2006 Date Data Arrived at EDR: 07/10/2006 Date Made Active in Reports: 09/12/2006 Number of Days to Update: 64

Source: EPA Region 7 Telephone: 913-551-7003 Last EDR Contact: 08/21/2006

Next Scheduled EDR Contact: 11/20/2006 Data Release Frequency: Varies

INDIAN LUST R6: Leaking Underground Storage Tanks on Indian Land LUSTs on Indian land in New Mexico and Oklahoma.

Date of Government Version: 01/04/2005 Date Data Arrived at EDR: 01/21/2005 Date Made Active in Reports: 02/28/2005 Number of Days to Update: 38

Source: EPA Region 6 Telephone: 214-665-6597 Last EDR Contact: 08/21/2006

Next Scheduled EDR Contact: 11/20/2006 Data Release Frequency: Varies

INDIAN UST R1: Underground Storage Tanks on Indian Land A listing of underground storage tank locations on Indian Land.

Date of Government Version: 06/08/2006 Date Data Arrived at EDR: 06/09/2006 Date Made Active in Reports: 06/30/2006 Number of Days to Update: 21

Source: EPA, Region 1 Telephone: 617-918-1313 Last EDR Contact: 08/21/2006

Next Scheduled EDR Contact: 11/20/2006 Data Release Frequency: Varies

INDIAN UST R5: Underground Storage Tanks on Indian Land

Date of Government Version: 12/02/2004 Date Data Arrived at EDR: 12/29/2004 Date Made Active in Reports: 02/04/2005 Number of Days to Update: 37

Source: EPA Region 5 Telephone: 312-886-6136 Last EDR Contact: 08/21/2006

Next Scheduled EDR Contact: 11/20/2006 Data Release Frequency: Varies

INDIAN UST R8: Underground Storage Tanks on Indian Land

Date of Government Version: 06/06/2006 Date Data Arrived at EDR: 06/09/2006 Date Made Active in Reports: 07/28/2006

Number of Days to Update: 49

Source: EPA Region 8 Telephone: 303-312-6137 Last EDR Contact: 08/21/2006

Next Scheduled EDR Contact: 11/20/2006 Data Release Frequency: Quarterly

INDIAN UST R10: Underground Storage Tanks on Indian Land

Date of Government Version: 06/08/2006 Date Data Arrived at EDR: 06/09/2006 Date Made Active in Reports: 07/28/2006

Number of Days to Update: 49

Source: EPA Region 10 Telephone: 206-553-2857 Last EDR Contact: 08/21/2006

Next Scheduled EDR Contact: 11/20/2006 Data Release Frequency: Quarterly

INDIAN UST R6: Underground Storage Tanks on Indian Land

Date of Government Version: 06/30/2006 Date Data Arrived at EDR: 07/03/2006 Date Made Active in Reports: 09/06/2006

Number of Days to Update: 65

Source: EPA Region 6 Telephone: 214-665-7591 Last EDR Contact: 08/21/2006

Next Scheduled EDR Contact: 11/20/2006 Data Release Frequency: Semi-Annually

INDIAN UST R9: Underground Storage Tanks on Indian Land

Date of Government Version: 06/01/2006 Date Data Arrived at EDR: 06/23/2006 Date Made Active in Reports: 08/02/2006

Number of Days to Update: 40

Source: EPA Region 9 Telephone: 415-972-3368 Last EDR Contact: 08/21/2006

Next Scheduled EDR Contact: 11/20/2006 Data Release Frequency: Quarterly

INDIAN UST R7: Underground Storage Tanks on Indian Land

Date of Government Version: 06/01/2006 Date Data Arrived at EDR: 07/10/2006 Date Made Active in Reports: 09/12/2006

Number of Days to Update: 64

Source: EPA Region 7 Telephone: 913-551-7003 Last EDR Contact: 08/21/2006

Next Scheduled EDR Contact: 11/20/2006 Data Release Frequency: Varies

EDR PROPRIETARY RECORDS

Manufactured Gas Plants: EDR Proprietary Manufactured Gas Plants

The EDR Proprietary Manufactured Gas Plant Database includes records of coal gas plants (manufactured gas plants) compiled by EDR's researchers. Manufactured gas sites were used in the United States from the 1800's to 1950's to produce a gas that could be distributed and used as fuel. These plants used whale oil, rosin, coal, or a mixture of coal, oil, and water that also produced a significant amount of waste. Many of the byproducts of the gas production, such as coal tar (oily waste containing volatile and non-volatile chemicals), sludges, oils and other compounds are potentially hazardous to human health and the environment. The byproduct from this process was frequently disposed of directly at the plant site and can remain or spread slowly, serving as a continuous source of soil and groundwater contamination.

Date of Government Version: N/A Date Data Arrived at EDR: N/A Date Made Active in Reports: N/A Number of Days to Update: N/A

Source: EDR, Inc. Telephone: N/A Last EDR Contact: N/A

Next Scheduled EDR Contact: N/A

Data Release Frequency: No Update Planned

OTHER DATABASE(S)

Depending on the geographic area covered by this report, the data provided in these specialty databases may or may not be complete. For example, the existence of wetlands information data in a specific report does not mean that all wetlands in the area covered by the report are included. Moreover, the absence of any reported wetlands information does not necessarily mean that wetlands do not exist in the area covered by the report.

CT MANIFEST: Hazardous Waste Manifest Data

Facility and manifest data. Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a tsd facility.

Date of Government Version: 12/31/2004 Date Data Arrived at EDR: 02/17/2006 Date Made Active in Reports: 04/07/2006

Number of Days to Update: 49

Source: Department of Environmental Protection

Telephone: 860-424-3375 Last EDR Contact: 09/11/2006

Next Scheduled EDR Contact: 12/11/2006 Data Release Frequency: Annually

NJ MANIFEST: Manifest Information

Hazardous waste manifest information.

Date of Government Version: 06/01/2006 Date Data Arrived at EDR: 07/06/2006 Date Made Active in Reports: 08/01/2006

Number of Days to Update: 26

Source: Department of Environmental Protection

Telephone: N/A

Last EDR Contact: 10/05/2006

Next Scheduled EDR Contact: 01/01/2007 Data Release Frequency: Annually

NY MANIFEST: Facility and Manifest Data

Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a TSD facility.

Date of Government Version: 08/01/2006 Date Data Arrived at EDR: 08/30/2006 Date Made Active in Reports: 10/16/2006 Number of Days to Update: 47

Source: Department of Environmental Conservation

Telephone: 518-402-8651 Last EDR Contact: 08/30/2006

Next Scheduled EDR Contact: 11/27/2006 Data Release Frequency: Annually

PA MANIFEST: Manifest Information Hazardous waste manifest information.

> Date of Government Version: 12/31/2005 Date Data Arrived at EDR: 05/04/2006 Date Made Active in Reports: 06/06/2006

Number of Days to Update: 33

Source: Department of Environmental Protection

Telephone: N/A

Last EDR Contact: 09/11/2006

Next Scheduled EDR Contact: 12/11/2006 Data Release Frequency: Annually

RI MANIFEST: Manifest information

Hazardous waste manifest information

Date of Government Version: 09/30/2005 Date Data Arrived at EDR: 05/09/2006 Date Made Active in Reports: 05/24/2006

Number of Days to Update: 15

Source: Department of Environmental Management

Telephone: 401-222-2797 Last EDR Contact: 09/18/2006

Next Scheduled EDR Contact: 12/18/2006 Data Release Frequency: Annually

VT MANIFEST: Hazardous Waste Manifest Data Hazardous waste manifest information.

> Date of Government Version: 12/31/2005 Date Data Arrived at EDR: 06/29/2006 Date Made Active in Reports: 07/31/2006 Number of Days to Update: 32

Source: Department of Environmental Conservation

Telephone: 802-241-3443 Last EDR Contact: 08/15/2006

Next Scheduled EDR Contact: 11/13/2006 Data Release Frequency: Annually

WI MANIFEST: Manifest Information

Hazardous waste manifest information.

Date of Government Version: 12/31/2005 Date Data Arrived at EDR: 03/17/2006

Date Made Active in Reports: 05/02/2006

Number of Days to Update: 46

Source: Department of Natural Resources

Telephone: N/A

Last EDR Contact: 10/23/2006

Next Scheduled EDR Contact: 01/08/2007 Data Release Frequency: Annually

Oil/Gas Pipelines: This data was obtained by EDR from the USGS in 1994. It is referred to by USGS as GeoData Digital Line Graphs from 1:100,000-Scale Maps. It was extracted from the transportation category including some oil, but primarily gas pipelines.

Electric Power Transmission Line Data

Source: PennWell Corporation Telephone: (800) 823-6277

This map includes information copyrighted by PennWell Corporation. This information is provided on a best effort basis and PennWell Corporation does not guarantee its accuracy nor warrant its fitness for any particular purpose. Such information has been reprinted with the permission of PennWell.

Sensitive Receptors: There are individuals deemed sensitive receptors due to their fragile immune systems and special sensitivity to environmental discharges. These sensitive receptors typically include the elderly, the sick, and children. While the location of all sensitive receptors cannot be determined, EDR indicates those buildings and facilities - schools, daycares, hospitals, medical centers, and nursing homes - where individuals who are sensitive receptors are likely to be located.

AHA Hospitals:

Source: American Hospital Association, Inc.

Telephone: 312-280-5991

The database includes a listing of hospitals based on the American Hospital Association's annual survey of hospitals.

Medical Centers: Provider of Services Listing

Source: Centers for Medicare & Medicaid Services

Telephone: 410-786-3000

A listing of hospitals with Medicare provider number, produced by Centers of Medicare & Medicaid Services,

a federal agency within the U.S. Department of Health and Human Services.

Nursing Homes

Source: National Institutes of Health

Telephone: 301-594-6248

Information on Medicare and Medicaid certified nursing homes in the United States.

Public Schools

Source: National Center for Education Statistics

Telephone: 202-502-7300

The National Center for Education Statistics' primary database on elementary

and secondary public education in the United States. It is a comprehensive, annual, national statistical database of all public elementary and secondary schools and school districts, which contains data that are comparable across all states.

Private Schools

Source: National Center for Education Statistics

Telephone: 202-502-7300

The National Center for Education Statistics' primary database on private school locations in the United States.

Daycare Centers: Licensed Child Day Care Facilities

Source: Department of Job & Family Services

Telephone: 614-466-6282

Flood Zone Data: This data, available in select counties across the country, was obtained by EDR in 1999 from the Federal Emergency Management Agency (FEMA). Data depicts 100-year and 500-year flood zones as defined by FEMA.

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002 and 2005 from the U.S. Fish and Wildlife Service.

State Wetlands Data: Wetlands Inventory

Source: Department of Natural Resources

Telephone: 614-265-1044

Scanned Digital USGS 7.5' Topographic Map (DRG)

Source: United States Geologic Survey
A digital raster graphic (DRG) is a scanned image of a U.S. Geological Survey topographic map. The map images are made by scanning published paper maps on high-resolution scanners. The raster image is georeferenced and fit to the Universal Transverse Mercator (UTM) projection.

STREET AND ADDRESS INFORMATION

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GEOCHECK®-PHYSICAL SETTING SOURCE ADDENDUM

TARGET PROPERTY ADDRESS

DOVER DAM **ROUTE 800 DOVER, OH 44622**

TARGET PROPERTY COORDINATES

Latitude (North):

40.55730 - 40° 33' 26.3"

Longitude (West): Universal Tranverse Mercator: Zone 17

81.4126 - 81° 24' 45.4"

465067.6

UTM X (Meters): UTM Y (Meters):

4489485.5

Elevation:

866 ft. above sea level

USGS TOPOGRAPHIC MAP

Target Property Map:

40081-E4 DOVER, OH

Most Recent Revision:

1997

EDR's GeoCheck Physical Setting Source Addendum is provided to assist the environmental professional in forming an opinion about the impact of potential contaminant migration.

Assessment of the impact of contaminant migration generally has two principle investigative components:

- 1. Groundwater flow direction, and
- 2. Groundwater flow velocity.

Groundwater flow direction may be impacted by surface topography, hydrology, hydrogeology, characteristics of the soil, and nearby wells. Groundwater flow velocity is generally impacted by the nature of the geologic strata.

GROUNDWATER FLOW DIRECTION INFORMATION

Groundwater flow direction for a particular site is best determined by a qualified environmental professional using site-specific well data. If such data is not reasonably ascertainable, it may be necessary to rely on other sources of information, such as surface topographic information, hydrologic information, hydrogeologic data collected on nearby properties, and regional groundwater flow information (from deep aquifers).

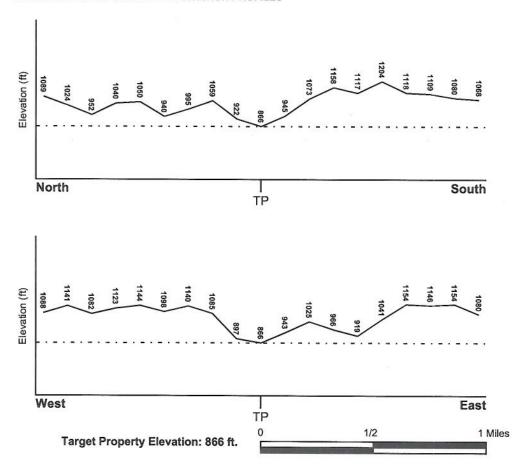
TOPOGRAPHIC INFORMATION

Surface topography may be indicative of the direction of surficial groundwater flow. This information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

TARGET PROPERTY TOPOGRAPHY

General Topographic Gradient: General ENE

SURROUNDING TOPOGRAPHY: ELEVATION PROFILES



Source: Topography has been determined from the USGS 7.5' Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified.

HYDROLOGIC INFORMATION

Surface water can act as a hydrologic barrier to groundwater flow. Such hydrologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

Refer to the Physical Setting Source Map following this summary for hydrologic information (major waterways and bodies of water).

FEMA FLOOD ZONE

Target Property County

TUSCARAWAS, OH

Flood Plain Panel at Target Property:

riosa riamir and at ranget reports

Additional Panels in search area:

NATIONAL WETLAND INVENTORY

NWI Quad at Target Property

DOVER

FEMA Flood

Electronic Data Not Available

Not Reported

Not Reported

NWI Electronic

Data Coverage Not Available

HYDROGEOLOGIC INFORMATION

Hydrogeologic information obtained by installation of wells on a specific site can often be an indicator of groundwater flow direction in the immediate area. Such hydrogeologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

AQUIFLOW®

Search Radius: 1.000 Mile.

EDR has developed the AQUIFLOW Information System to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted by environmental professionals to regulatory authorities at select sites and has extracted the date of the report, groundwater flow direction as determined hydrogeologically, and the depth to water table.

MAP ID Not Reported LOCATION FROM TP GENERAL DIRECTION GROUNDWATER FLOW

GROUNDWATER FLOW VELOCITY INFORMATION

Groundwater flow velocity information for a particular site is best determined by a qualified environmental professional using site specific geologic and soil strata data. If such data are not reasonably ascertainable, it may be necessary to rely on other sources of information, including geologic age identification, rock stratigraphic unit and soil characteristics data collected on nearby properties and regional soil information. In general, contaminant plumes move more quickly through sandy-gravelly types of soils than silty-clayey types of soils.

GEOLOGIC INFORMATION IN GENERAL AREA OF TARGET PROPERTY

Geologic information can be used by the environmental professional in forming an opinion about the relative speed at which contaminant migration may be occurring.

ROCK STRATIGRAPHIC UNIT

GEOLOGIC AGE IDENTIFICATION

Era:

Paleozoic

Category: Stratifed Sequence

System:

Pennsylvanian

Series:

Atokan and Morrowan Series

Code:

PP1 (decoded above as Era, System & Series)

Geologic Age and Rock Stratigraphic Unit Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - a digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

DOMINANT SOIL COMPOSITION IN GENERAL AREA OF TARGET PROPERTY

The U.S. Department of Agriculture's (USDA) Soil Conservation Service (SCS) leads the National Cooperative Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. Soil maps for STATSGO are compiled by generalizing more detailed (SSURGO) soil survey maps. The following information is based on Soil Conservation Service STATSGO data.

Soil Component Name:

COSHOCTON

Soil Surface Texture:

silt loam

Hydrologic Group:

Class C - Slow infiltration rates. Soils with layers impeding downward movement of water, or soils with moderately fine or fine textures.

Soil Drainage Class:

Moderately well drained. Soils have a layer of low hydraulic conductivity, wet state high in the profile. Depth to water table is 3

to 6 feet.

Hydric Status: Soil does not meet the requirements for a hydric soil.

Corrosion Potential - Uncoated Steel: HIGH

Depth to Bedrock Min:

> 40 inches

Depth to Bedrock Max:

> 84 inches

			Soil Layer	Information			
	Воц	ındary		Classi	fication		
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil	Permeability Rate (in/hr)	Soil Reaction (pH)
1	0 inches	7 inches	silt loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), silt.	Max: 2.00 Min: 0.60	Max: 7.30 Min: 3.60
2	7 inches	14 inches	silt loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 2.00 Min: 0.20	Max: 5.50 Min: 3.60
3	14 inches	46 inches	silty clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 0.60 Min: 0.06	Max: 5.50 Min: 3.60
4	46 inches	58 inches	shaly - silty clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 0.60 Min: 0.06	Max: 6.00 Min: 4.50
5	58 inches	62 inches	weathered bedrock	Not reported	Not reported	Max: 0.20 Min: 0.00	Max: 0.00 Min: 0.00

OTHER SOIL TYPES IN AREA

Based on Soil Conservation Service STATSGO data, the following additional subordinant soil types may appear within the general area of target property.

Soil Surface Textures: gravelly - clay loam channery - loam

sandy loam

Surficial Soil Types:

gravelly - clay loam channery - loam sandy loam

Shallow Soil Types:

silty clay loam

channery - sandy loam

silty clay

Deeper Soil Types:

very channery - clay loam

stratified

unweathered bedrock

silt loam

gravelly - sandy loam

LOCAL / REGIONAL WATER AGENCY RECORDS

EDR Local/Regional Water Agency records provide water well information to assist the environmental professional in assessing sources that may impact ground water flow direction, and in forming an opinion about the impact of contaminant migration on nearby drinking water wells.

WELL SEARCH DISTANCE INFORMATION

DATABASE

SEARCH DISTANCE (miles)

Federal USGS

1.000

Federal FRDS PWS

Nearest PWS within 1 mile

State Database

1.000

FEDERAL USGS WELL INFORMATION

MAP ID

WELL ID

LOCATION FROM TP

No Wells Found

FEDERAL FRDS PUBLIC WATER SUPPLY SYSTEM INFORMATION

MAP ID

WELL ID

LOCATION FROM TP

No PWS System Found

Note: PWS System location is not always the same as well location.

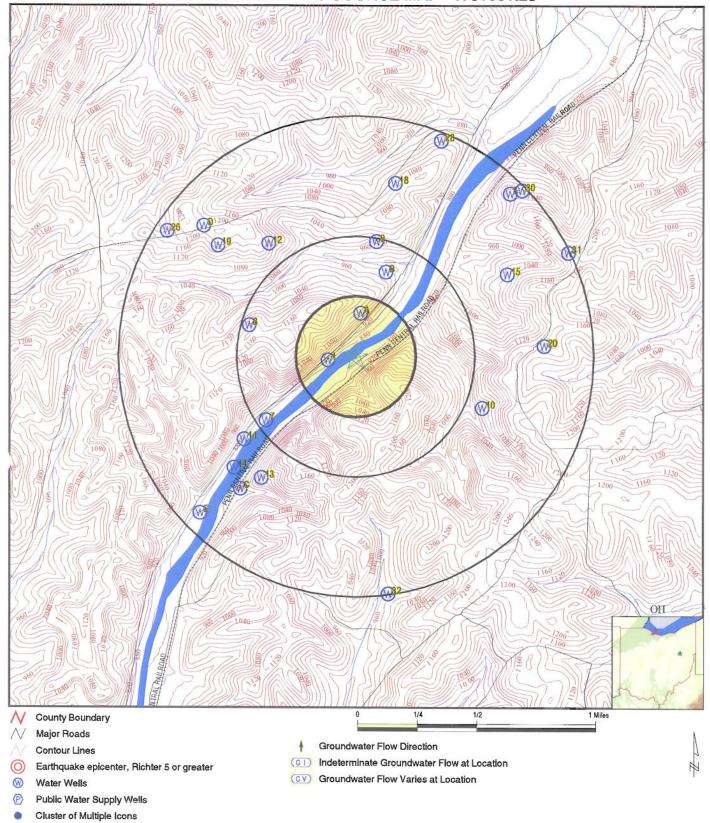
STATE DATABASE WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
1	OHPW10000003489	0 - 1/8 Mile West
A2	OHD10000053838	1/8 - 1/4 Mile North
A3	OHD10000053848	1/8 - 1/4 Mile North
B4	OHD10000053972	1/4 - 1/2 Mile NNE
B5	OHD10000053992	1/4 - 1/2 Mile NNE
B6	OHD100000054028	1/4 - 1/2 Mile NNE
7	OHD100000053536	1/4 - 1/2 Mile SW
8 9	OHD10000053809	1/4 - 1/2 Mile WNW
9	OHD100000054112	1/4 - 1/2 Mile North
10	OHD10000053572	1/2 - 1 Mile ESE
11	OHD100000053464	1/2 - 1 Mile SW
12	OHD100000054103	1/2 - 1 Mile NW
13	OHD10000053307	1/2 - 1 Mile SW
14	OHD100000053357	1/2 - 1 Mile SW
15	OHD100000053990	1/2 - 1 Mile ENE
C16	OHD10000053235	1/2 - 1 Mile SW
C17	OHD100000053236	1/2 - 1 Mile SW
18	OHD10000054354	1/2 - 1 Mile NNE
19	OHD10000054089	1/2 - 1 Mile NW
20	OHD100000053763	1/2 - 1 Mile East

STATE DATABASE WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
D21	OHD100000054184	1/2 - 1 Mile NW
D22	OHD10000054177	1/2 - 1 Mile NW
E23	OHD10000053150	1/2 - 1 Mile SW
F24	OHD100000054291	1/2 - 1 Mile NE
F25	OHPW1000003523	1/2 - 1 Mile NE
26	OHD100000054160	1/2 - 1 Mile WNW
E27	OHD10000053104	1/2 - 1 Mile SW
28	OHD10000054492	1/2 - 1 Mile NNE
F29	OHD10000054312	1/2 - 1 Mile NE
30	OHD10000054308	1/2 - 1 Mile NE
31	OHD10000054060	1/2 - 1 Mile ENE
32	OHD100000052866	1/2 - 1 Mile South

PHYSICAL SETTING SOURCE MAP - 1781681.2s



SITE NAME: Dover Dam Route 800 Dover OH 44622 ADDRESS: LAT/LONG: 40.5573 / 81.4126 CLIENT: U.S. Army Corps of Engineers CONTACT: Nick McHenry

INQUIRY#: 1781681.2s

DATE: October 24, 2006 8:13 pm

GEOCHECK®-PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID				
Direction Distance Elevation			Database	EDR ID Number
1 West 0 - 1/8 Mile Higher			OH WELLS	OHPW10000003489
00000000 W	123568			
Well place: Well name:	Usace-Dover Dam WELL	0001		
Trans from:	55362	0001		
Trans from:				
Pws id:	42955 7946412			
	207.00007			
Pws name:	USACE-Dover Dam TNC			
Pws type:		0	OFFIC	
County: Latitude:	Tuscarawas	Oepa distr:	SEDO	
Longitude:	40.557083 -81.414819			
Horizontal:	1			
Geoloc II :	None	Coolea h	Motors	
Geoloc h d:	WGS84	Geoloc h u:	Meters	
Geoloc h m:		(Decode Berne) Differential (2000)	
Geoloc II III.	Verified relative to map fea	(Pseudo Range) Differential (I	JGPS)	
LI collect:	Not Reported	atures(1:24K or TIGER)		
<u> </u>	21. 9700-000 Sept 1			
A2 North 1/8 - 1/4 Mile Higher			OH WELLS	OHD10000053838
Well log n:	9979058	Well type :	W	
Cnty code:	157	Twp code:	910	
Orig owner:	Not Reported	Orig own 1:	GEO.SCHWORN	
Well use c:	Not Reported	Aquifer ty:	SHA	
St dir cod:	Not Reported	St no:	Not Reported	
St name:	Not Reported	St type co:	Not Reported	
City:	Not Reported	State code:	ОН	
Zip:	Not Reported	Horiz x:	2302176.9	
Horiz y:	327264.4	Latitude:	Not Reported	
Longitude:	Not Reported	Total dept:	63	
A3 North 1/8 - 1/4 Mile Higher		31.49	OH WELLS	OHD100000053848
	1219/222707			
Well log n:	14571	Well type :	W	
Cnty code:	157	Twp code:	910	
Orig owner:	W	Orig own 1:	SCHWARM	
Well use c:	Not Reported	Aquifer ty:	SST	
St dir cod:	Not Reported	St no:	Not Reported	
St name:	8	St type co:	SR	
City:	Not Reported	State code:	OH	
Zip:	Not Reported	Horiz x:	2302225.84	
Horiz y:	327313.31	Latitude:	Not Reported	
Longitude:	Not Reported	Total dept:	200	

GEOCHECK®-PHYSICAL SETTING SOURCE MAP FINDINGS

Distance Elevation			Database	EDR ID Numbe
34 NNE I/4 - 1/2 Mile Higher			OH WELLS	OHD1000005397
Well log n:	418329	Well type :	W	
Cnty code:	157	Twp code:	910	
Orig owner:	Not Reported	Orig own 1:	DEPT. OF ARMY H	LINTIN
Well use c:	Not Reported	Aquifer ty:	SST	Oltrint
St dir cod:	Not Reported	St no:	Not Reported	
St name:	8	St type co:	SR	
City:	Not Reported	State code:	OH	
Zip:	Not Reported	Horiz x:		
			2302811.15	
Horiz y:	328045.24	Latitude:	Not Reported	
Longitude:	Not Reported	Total dept:	120	
35				
INE /4 - 1/2 Mile ligher			OH WELLS	OHD1000005399
Well log n:	63923	Well type :	W	
Cnty code:	157	Twp code:	910	
Orig owner:	Not Reported	Orig own 1:	TUSCARAWAS CO	POLICE
Well use c:	Not Reported	Aquifer ty:	SST	87 - 67 COM (7 6 7 6 7 6 7 6 7 6 7 6 7 6 7 6 7 6 7
St dir cod:	Not Reported	St no:	Not Reported	
St name:	8	St type co:	SR	
City:	Not Reported	State code:	OH	
Zip:	Not Reported	Horiz x:	2302543.93	
Horiz y:	328169.14	Latitude:	Not Reported	
Longitude:	Not Reported	Total dept:	119	
36 INE /4 - 1/2 Mile ligher			OH WELLS	OHD10000005402
Well log n:	73024	Well type :	W	
Cnty code:	157	Twp code:	910	
Orig owner:	Not Reported	Orig own 1:	U.S.ENGINEERS	
Well use c:	Not Reported	Aquifer ty:	SST	
St dir cod:	Not Reported	St no:	Not Reported	
St name:	8	St type co:	SR	
City:	Not Reported	State code:	OH	
Zip:	Not Reported	Horiz x:	2302886.49	
Horiz y:	328389.21	Latitude:	Not Reported	
Longitude:	Not Reported	Total dept:	90	

7 SW 1/4 - 1/2 Mile Higher

OH WELLS OHD10000053536

Well log n: 234151 Well type: W Cnty code: 157 Twp code: 800 Orig owner: WILLIAM Orig own 1: **SCHIMANN** Well use c: Not Reported Aquifer ty: SST St dir cod: Not Reported St no: Not Reported St name: St type co: SR City: Not Reported State code: OH Zip: Not Reported Horiz x: 2300137.02 Horiz y: 324915.45 Latitude: Not Reported Longitude: Not Reported Total dept: 170

8 WNW 1/4 - 1/2 Mile Higher

OH WELLS OHD100000053809

Well log n: 911317 Cnty code: 169 Orig owner: Not Reported Well use c: D St dir cod: Not Reported St name: **BIERI** City: MARSHALLVILLE Zip: 44645 Horiz y: Not Reported

-81.42107

Not Reported

Well type: W Twp code: 580 Orig own 1: **ROBISON HOMES** Aquifer ty: SHA St no: 15788 St type co: RD State code: ОН Horiz x: Latitude:

Not Reported 40.5592 202

North 1/4 - 1/2 Mile Higher

Longitude:

OH WELLS OHD100000054112

Well log n: 14872 Cnty code: 157 Orig owner: 0 Well use c: Not Reported St dir cod: Not Reported St name: City: Not Reported Not Reported Zip: Horiz y: 328865.85

Well type: Twp code: Orig own 1: Aquifer ty: St no: St type co: State code: Horiz x: Latitude: Total dept:

Total dept:

SND Not Reported SR OH 2302529.48 Not Reported

W

68

910

BROWN

1/2 - 1 Mile Higher

Longitude:

OH WELLS OHD100000053572

892846 Well log n: Cnty code: 169 Orig owner: HARVEY Well use c: St dir cod: Not Reported St name: WARWICK City: MARSHALLVILLE Zip: 44645 Horiz y: Not Reported Longitude: -81.40252

Well type: W Twp code: 580 Orig own 1: SLUSSAR Aquifer ty: SGR St no: 17747 St type co: RD State code: OH Horiz x: Not Reported Latitude: 40.5542 Total dept: 234

14 SW 1/2 - 1 Mile Lower			OH WELLS	OHD100000053357
St dir cod: St name: City: Zip: Horiz y: Longitude:	Not Reported 8 Not Reported Not Reported 323652.79 Not Reported	St no: St type co: State code: Horiz x: Latitude: Total dept:	Not Reported SR OH 2300050.78 Not Reported 32	
Well log n: Cnty code: Orig owner: Well use c:	39817 157 RALPH Not Reported	Well type : Twp code: Orig own 1: Aquifer ty:	W 800 WALTZ SST	
13 SW 1/2 - 1 Mile Higher			OH WELLS	OHD100000053307
Longitude:	Not Reported	Total dept:	Not Reported 440	
Zip: Horiz y:	Not Reported 328794.92	Horiz x: Latitude:	2300148.07	
City:	Not Reported	State code:	ОН	
St uir cod:	FROMAN	St no: St type co:	Not Reported TR	
Well use c: St dir cod:	Not Reported Not Reported	Aquifer ty:	SST	
Orig owner:	DON	Orig own 1:	WHITEMYER	
Well log n: Cnty code:	531426 157	Well type : Twp code:	W 800	
Higher	504400			
12 NW 1/2 - 1 Mile			OH WELLS	OHD10000005410
Longitude:	-81.4215	Total dept:	107	
Horiz y:	Not Reported	Latitude:	Not Reported 40.552333	
City: Zip:	DOVER 44622	State code: Horiz x:	OH	
St name:	800	St type co:	SR	
St dir cod:	NE	St no:	4823	
Well use c:	D	Aquifer ty:	SST	
Orig owner:	MAX	Orig own 1:	SPRINGER	
Well log n: Cnty code:	950120 157	Well type : Twp code:	W 800	
1/2 - 1 Mile Higher		2000		
11 SW			OH WELLS	OHD10000005346
Elevation			Database	EDR ID Numbe
Map ID Direction Distance Elevation			Database	EDR ID Numb

Well log n: 192968 Well type: W Cnty code: 157 800 Twp code: Orig owner: WALTER Orig own 1: SCHAAR Well use c: Not Reported Aquifer ty: SHA St dir cod: Not Reported St no: Not Reported St name: St type co: SR City: Not Reported State code: OH Zip: Not Reported 2299440.6 Horiz x: Horiz y: 323869.83 Latitude: Not Reported Longitude: Not Reported Total dept:

ENE 1/2 - 1 Mile Higher

OH WELLS OHD100000053990

892849 Well log n: Well type: W Cnty code: 169 Twp code: 580 Orig owner: TOM Orig own 1: HAYES Well use c: D Aquifer ty: SST St dir cod: Not Reported St no: 11252 St name: FRAZE St type co: RD City: DOYLESTOWN State code: ОН Zip: 44230 Horiz x: Not Reported Horiz y: Not Reported 40.56226 Latitude:

Longitude: -81.40054 Total dept: 210

C16 1/2 - 1 Mile Higher

OH WELLS OHD100000053235

Well log n: 479667 Well type: W Cnty code: 157 Twp code: 800 Orig owner: HERBERT Orig own 1: **HATCHER** Well use c: Not Reported Aquifer ty: SHA St dir cod: Not Reported St no: Not Reported St name: 800 St type co: SR City: Not Reported State code: OH Zip: Not Reported Horiz x: 2299585.82 Horiz y: 323408.65 Latitude: Not Reported Longitude: Not Reported

Total dept:

1/2 - 1 Mile Higher

OH WELLS OHD100000053236

55

Well log n: 471023 Well type: W Cnty code: 157 Twp code: 800 HERBERT Orig owner: Orig own 1: HATCHER Well use c: Not Reported Aquifer ty: SST St dir cod: Not Reported St no: Not Reported St name: 800 St type co: SR City: Not Reported State code: ОН Zip: Not Reported Horiz x: 2299585.82 Horiz y: 323408.65 Latitude: Not Reported Longitude: Not Reported Total dept: 58

Map ID Direction Distance Elevation			Database	EDR ID Number
18 NNE 1/2 - 1 Mile Higher			OH WELLS	OHD100000054354
Well log n: Cnty code: Orig owner: Well use c: St dir cod: St name: City: Zip: Horiz y: Longitude:	162750 157 RAY Not Reported Not Reported 378 Not Reported Not Reported 330143.84 Not Reported	Well type: Twp code: Orig own 1: Aquifer ty: St no: St type co: State code: Horiz x: Latitude: Total dept:	W 910 BASH ROC Not Reported TR OH 2302931.87 Not Reported 83	
19 NW 1/2 - 1 Mile Higher			OH WELLS	OHD100000054089
Well log n: Cnty code: Orig owner: Well use c: St dir cod: St name: City: Zip: Horiz y: Longitude:	924043 169 Not Reported D Not Reported GENET DOYALSTOWN Not Reported Not Reported -81.4236	Well type: Twp code: Orig own 1: Aquifer ty: St no: St type co: State code: Horiz x: Latitude: Total dept:	W 580 STUKOUSKY Not Reported 11366 Not Reported OH Not Reported 40.564 70	Y.
20 East 1/2 - 1 Mile Higher			OH WELLS	OHD100000053763
Well log n: Cnty code: Orig owner: Well use c: St dir cod: St name: City: Zip: Horiz y: Longitude:	280652 157 LUTHER Not Reported Not Reported BOY SCOUT Not Reported Not Reported 326619.26 Not Reported	Well type: Twp code: Orig own 1: Aquifer ty: St no: St type co: State code: Horiz x: Latitude: Total dept:	W 910 RENNICKER SST Not Reported CR OH 2306285.16 Not Reported 165	

D21 NW 1/2 - 1 Mile Higher

OH WELLS OHD10000054184

Well log n: 339366 Well type: W Cnty code: 157 800 Twp code: Orig owner: GALE Orig own 1: ARNOLD Well use c: Not Reported Aquifer ty: SST St dir cod: Not Reported St no: Not Reported St name: FROMAN St type co: TR City: Not Reported State code: ОН Zip: Not Reported 2298788.4 Horiz x: Horiz y: 329169.14 Latitude: Not Reported Longitude: Not Reported Total dept: 339

D22 NW 1/2 - 1 Mile Higher

OH WELLS OHD100000054177

70

Well log n: 162701 Well type: W Cnty code: 157 800 Twp code: Orig owner: **THOMAS** Orig own 1: SCHILLING Well use c: Not Reported Aquifer ty: SHA St dir cod: Not Reported Not Reported St no: St name: **FROMAN** St type co: TR City: Not Reported State code: ОН Zip: Not Reported Horiz x: 2298606.61 Horiz y: 329152.21 Latitude: Not Reported Longitude: Not Reported Total dept: 107

E23 SW 1/2 - 1 Mile Lower

OH WELLS OHD100000053150

Well log n: 303052 Well type: W Cnty code: 157 Twp code: 800 Orig owner: HARRY Orig own 1: **GREEN** Well use c: Not Reported Aquifer ty: SHA St dir cod: Not Reported Not Reported St no: St name: St type co: SR City: Not Reported State code: OH Zip: Not Reported 2298812.19 Horiz x: Horiz y: 323011.85 Latitude: Not Reported Longitude: Not Reported Total dept:

NE 1/2 - 1 Mile Higher

OH WELLS OHD100000054291

Well log n: 283223 Well type: W Cnty code: 157 Twp code: 910 Orig owner: Not Reported Orig own 1: BOY SCOUTS OF AMERIC Well use c: Not Reported Aquifer ty: St dir cod: Not Reported Not Reported St no: **BOY SCOUT** St name: St type co: CR City: Not Reported State code: OH Zip: Not Reported 2305319.41 Horiz x: Horiz y: 329928.6 Latitude: Not Reported Longitude: Not Reported Total dept: 617

Map ID Direction Distance Elevation			Database	EDR ID Number
F25 NE 1/2 - 1 Mile Higher			OH WELLS	OHPW10000003523
Well place: Well name: Trans from: Trans to: Pws id: Pws name: Pws type:	123630 Camp Tuscazoar Founda 55362 43015 7948012 Camp Tuscazoar Founda TNC	ition, Inc.		
County: Latitude: Longitude: Horizontal:	Tuscarawas 40.566944 -81.400278 500	Oepa distr:	SEDO	
Geoloc II : Geoloc h d: Geoloc h m: Geoloc ver: LI collect:	1:24,000 NAD27 Interpolation-Map NOT VERIFIED Not Reported	Geoloc h u:	Feet	
26 WNW 1/2 - 1 Mile Higher			OH WELLS	OHD100000054160
Well log n: Cnty code: Orig owner: Well use c: St dir cod: St name: City: Zip: Horiz y: Longitude:	500350 157 DURK Not Reported Not Reported 38 Not Reported Not Reported 329033.99 Not Reported	Well type: Twp code: Orig own 1: Aquifer ty: St no: St type co: State code: Horiz x: Latitude: Total dept:	W 800 SIMMONS BIS Not Reported TR OH 2297884.39 Not Reported 455	
E27 SW 1/2 - 1 Mile Lower			OH WELLS	OHD100000053104
Well log n: Cnty code: Orig owner: Well use c: St dir cod: St name: City: Zip: Horiz y: Longitude:	340018 157 WALTER Not Reported Not Reported 8 Not Reported Not Reported 322721.52 Not Reported	Well type: Twp code: Orig own 1: Aquifer ty: St no: St type co: State code: Horiz x: Latitude: Total dept:	W 800 SCHAAR SST Not Reported SR OH 2298580.11 Not Reported 332	

Elevation			Database	EDR ID Number
28 NNE 1/2 - 1 Mile Higher			OH WELLS	OHD100000054492
Well log n:	905360	Well type :	W	
Cnty code:	157	Twp code:	910	
Orig owner:	40.5702778	Orig own 1:	BILTON	
Well use c:	D	Aguifer ty:	SHA	
St dir cod:	NE	St no:	2700	
St name:	FROMAN HILL	St type co:	RD	
City:	DOVER	State code:	ОН	
Zip:	44622	Horiz x:	Not Reported	
Horiz y:	Not Reported	Latitude:	40.570278	
Longitude:	-81.405833	Total dept:	140	
F29 NE				
NE 1/2 - 1 Mile			OH WELLS	OHD100000054312
Higher				
Well log n:	531420	Well type :	W	
Cnty code:	157	Twp code:	910	
Orig owner:	Not Reported	Orig own 1:	BUCKEYE COUNCIL	
Well use c:	Not Reported	Aquifer ty:	SHA	
St dir cod:	Not Reported	St no:	Not Reported	
St name:	BOY SCOUT	St type co:	CR .	
City:	Not Reported	State code:	ОН	
Zip:	Not Reported	Horiz x:	2305641.33	
Horiz y:	330036.22	Latitude:	Not Reported	
Longitude:	Not Reported	Total dept:	660	
30				9
NE 1/2 - 1 Mile Higher			OH WELLS	OHD10000054308
Well log n:	36441	Well type :	W	
Cnty code:	157	Twp code:	910	
Orig owner:	Not Reported	Orig own 1:	BOY SCOUTS OF A	М.
Well use c:	Not Reported	Aquifer ty:	SHA	
St dir cod:	Not Reported	St no:	Not Reported	
St name:	Not Reported	St type co:	Not Reported	
City:	Not Reported	State code:	ОН	
Zip:	Not Reported	Horiz x:	2305749.35	
Horiz y:	330027.52	Latitude:	Not Reported	
Longitude:	Not Reported	Total dept:	559	
	331 835000		- Xensell - L	

TC1781681.2s Page A-17

Well log n: Cnty code: 330153 157

Well type: Twp code:

W 910

CR

Orig owner: Well use c: St dir cod:

Not Reported Not Reported Not Reported **BOY SCOUT** Not Reported Orig own 1: Aquifer ty: St no:

BOY OF AMERICA COL Not Reported

City: Zip: Horiz y: Longitude:

St name:

Not Reported 328677.51 Not Reported St type co: State code: Horiz x: Latitude:

ОН 2306794.86 Not Reported

Total dept: 229

32 South 1/2 - 1 Mile Higher

OH WELLS

OHD100000052866

Well log n: Cnty code: Orig owner: Well use c: St dir cod: St name: City:

950122 157 LOUIS D NE RABER DOVER Zip: 44622 Horiz y: Not Reported Longitude: -81.41

Well type: Twp code: Orig own 1: Aquifer ty: St no: St type co:

State code: Horiz x: Latitude: Total dept:

W 910 SETTIMIO SHA 4511 DR ОН Not Reported

AREA RADON INFORMATION

State Database: OH Radon

Radon Test Results

Zip	Total Sites	Median	1st Quartile	3rd Quartile	Min.	Max.
			-	-		
44622	73	4	2.1	7.43	0.3	27.2

Federal EPA Radon Zone for TUSCARAWAS County: 1

Note: Zone 1 indoor average level > 4 pCi/L.

: Zone 2 indoor average level >= 2 pCi/L and <= 4 pCi/L.

: Zone 3 indoor average level < 2 pCi/L.

Federal Area Radon Information for Zip Code: 44622

Number of sites tested: 2

Area Average Activity % <4 pCi/L % 4-20 pCi/L % >20 pCi/L Living Area - 1st Floor Not Reported Not Reported Not Reported Not Reported Living Area - 2nd Floor Not Reported Not Reported Not Reported Not Reported 5.550 pCi/L Basement 0% 100% 0%

PHYSICAL SETTING SOURCE RECORDS SEARCHED

TOPOGRAPHIC INFORMATION

USGS 7.5' Digital Elevation Model (DEM)

Source: United States Geologic Survey

EDR acquired the USGS 7.5 Digital Elevation Model in 2002 and updated it in 2006. The 7.5 minute DEM corresponds to the USGS 1:24,000- and 1:25,000-scale topographic quadrangle maps. The DEM provides elevation data with consistent elevation units and projection.

Scanned Digital USGS 7.5' Topographic Map (DRG)

Source: United States Geologic Survey

A digital raster graphic (DRG) is a scanned image of a U.S. Geological Survey topographic map. The map images are made by scanning published paper maps on high-resolution scanners. The raster image is georeferenced and fit to the Universal Transverse Mercator (UTM) projection.

HYDROLOGIC INFORMATION

Flood Zone Data: This data, available in select counties across the country, was obtained by EDR in 1999 from the Federal Emergency Management Agency (FEMA). Data depicts 100-year and 500-year flood zones as defined by FEMA.

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002 and 2005 from the U.S. Fish and Wildlife Service.

State Wetlands Data: Wetlands Inventory

Source: Department of Natural Resources

Telephone: 614-265-1044

HYDROGEOLOGIC INFORMATION

AQUIFLOWR Information System

Source: EDR proprietary database of groundwater flow information

EDR has developed the AQUIFLOW Information System (AIS) to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted to regulatory authorities at select sites and has extracted the date of the report, hydrogeologically determined groundwater flow direction and depth to water table information.

GEOLOGIC INFORMATION

Geologic Age and Rock Stratigraphic Unit

Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - A digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

STATSGO: State Soil Geographic Database

Source: Department of Agriculture, Natural Resources Conservation Services

The U.S. Department of Agriculture's (USDA) Natural Resources Conservation Service (NRCS) leads the national Conservation Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. Soil maps for STATSGO are compiled by generalizing more detailed (SSURGO) soil survey maps.

SSURGO: Soil Survey Geographic Database

Source: Department of Agriculture, Natural Resources Conservation Services (NRCS)

Telephone: 800-672-5559

SSURGO is the most detailed level of mapping done by the Natural Resources Conservation Services, mapping scales generally range from 1:12,000 to 1:63,360. Field mapping methods using national standards are used to construct the soil maps in the Soil Survey Geographic (SSURGO) database. SSURGO digitizing duplicates the original soil survey maps. This level of mapping is designed for use by landowners, townships and county natural resource planning and management.

PHYSICAL SETTING SOURCE RECORDS SEARCHED

LOCAL / REGIONAL WATER AGENCY RECORDS

FEDERAL WATER WELLS

PWS: Public Water Systems

Source: EPA/Office of Drinking Water

Telephone: 202-564-3750

Public Water System data from the Federal Reporting Data System. A PWS is any water system which provides water to at

least 25 people for at least 60 days annually. PWSs provide water from wells, rivers and other sources.

PWS ENF: Public Water Systems Violation and Enforcement Data

Source: EPA/Office of Drinking Water

Telephone: 202-564-3750

Violation and Enforcement data for Public Water Systems from the Safe Drinking Water Information System (SDWIS) after

August 1995. Prior to August 1995, the data came from the Federal Reporting Data System (FRDS).

USGS Water Wells: USGS National Water Inventory System (NWIS)

This database contains descriptive information on sites where the USGS collects or has collected data on surface water and/or groundwater. The groundwater data includes information on wells, springs, and other sources of groundwater.

STATE RECORDS

Public Water System Data

Source: Ohio Environmental Protection Agency

Telephone: 614-644-3677

The database includes community, transient noncommunity and nontransient noncommunity water wells; and source

treatment unit locations.

Water Well Database

Source: Department of Natural Resources

Telephone: 614-265-6747

OTHER STATE DATABASE INFORMATION

RADON

State Database: OH Radon

Source: Department of Health Telephone: 614-644-2727

Radon Statistics for Zip Code Areas

Area Radon Information

Source: USGS

Telephone: 703-356-4020

The National Radon Database has been developed by the U.S. Environmental Protection Agency

(USEPA) and is a compilation of the EPA/State Residential Radon Survey and the National Residential Radon Survey. The study covers the years 1986 - 1992. Where necessary data has been supplemented by information collected at

private sources such as universities and research institutions.

EPA Radon Zones

Source: EPA

Telephone: 703-356-4020

Sections 307 & 309 of IRAA directed EPA to list and identify areas of U.S. with the potential for elevated indoor

radon levels.

OTHER

Airport Landing Facilities: Private and public use landing facilities

Source: Federal Aviation Administration, 800-457-6656

Epicenters: World earthquake epicenters, Richter 5 or greater

Source: Department of Commerce, National Oceanic and Atmospheric Administration

PHYSICAL SETTING SOURCE RECORDS SEARCHED

STREET AND ADDRESS INFORMATION

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The EDR Aerial Photo **Decade Package**

Dover Dam Route 800 Dover, OH 44622

Inquiry Number: 1781681.5

October 24, 2006

The Standard in **Environmental Risk Management Information**

440 Wheelers Farms Road Milford, Connecticut 06461

Nationwide Customer Service

Telephone: 1-800-352-0050

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"Linking Technology with Tradition"®

Sanborn® Map Report

Ship To: Nick McHenry

Order Date: 10/24/2006 Completion Date: 10/24/2006

U.S. Army Corps of

Inquiry #: 1781681.3

502 8th Street

P.O. #:

NA

Huntington, WV 25701

Site Name: Dover Dam

Address:

Route 800

Customer Project:

Dover DSA

City/State: Dover, OH 44622

1068558RLB

304-399-5909

Cross Streets:

This document reports that the largest and most complete collection of Sanborn fire insurance maps has been reviewed based on client supplied information, and fire insurance maps depicting the target property at the specified address were not identified.

NO COVERAGE

This Report contains certain information obtained from a variety of public and other sources reasonably available to Environmental Data Resources, Inc. It cannot be concluded from this Report that coverage information for the target and surrounding properties does not exist from other sources. NO WARRANTY EXPRESSED OR IMPLIED, IS MADE WHATSOEVER IN CONNECTION WITH THIS REPORT. ENVIRONMENTAL DATA RESOURCES, INC. SPECIFICALLY DISCLAIMS THE MAKING OF ANY SUCH WARRANTIES, INCLUDING WITHOUT LIMITATION, MERCHANTABILITY OR FITNESS FOR A PARTICULAR USE OR PURPOSE. ALL RISK IS ASSUMED BY THE USER. IN NO EVENT SHALL ENVIRONMENTAL DATA RESOURCES, INC. BE LIABLE TO ANYONE, WHETHER ARISING OUT OF ERRORS OR OMISSIONS, NEGLIGENCE, ACCIDENT OR ANY OTHER CAUSE, FOR ANY LOSS OF DAMAGE, INCLUDING, WITHOUT LIMITATION, SPECIAL, INCIDENTAL, CONSEQUENTIAL, OR EXEMPLARY DAMAGES. ANY LIABILITY ON THE PART OF ENVIRONMENTAL DATA PESOURCES, INC. IS STRICTLY LIMITED TO A REFUND OF THE AMOUNT PAID FOR THIS REPORT. Purchaser accepts this Report AS IS. Any analyses, estimates, ratings, invironmental risk levels or risk codes provided in this Report are provided for illustrative purposes only, and are not intended to provide, nor should they be interpreted as providing any facts agarding, or prediction or forecast of, any environmental risk for any property. Only a Phase I Environmental Site Assessment performed by an environmental professional can provide information regarding the environmental risk for any property. Additionally, the information provided in this Report is not to be construed as legal advice.

ATTACHMENT 4
QUALITY CONTROL PLAN

PROGRAMMATIC QUALITY CONTROL PLAN FOR PHASE I HTRW SITE INVESTIGATIONS

I. Purpose.

This Quality Control Plan (QCP) presents the policy and specific actions that are being implemented on this program to insure that high quality products are produced on time and within budget. It defines the responsibilities and roles of each member on the Independent Quality Control Team. This QCP covers the review of Phase I HTRW Investigations prepared by the Environmental and Remediation Section (CELRH-EC-CE) and those prepared by an Architect-Engineer (A-E) consultant.

II. References.

- a. ER 1110-1-2 Engineering and Design Quality Management
- b. CELRDC 5-1-1 Quality Management Plan
- c. CELRHR 5-2-5 Quality Management Plan
- d. EM 385-1-1 Safety and Health Requirements Manual
- e. ASTM E 1527-00 and E 1528-00, ASTM Standards on Environmental Site Assessments for Commercial Real Estate
- f. CEORD-DL-P Memorandum, Section 202 Voluntary Non Structural Program, HTRW Policy, 9 September 1994

III. General.

- A. Type of Project Phase I HTRW Environmental Site Assessment Report on Dover Dam DSA Contract Work Limits
- B. Location Dover Dam, Route 800, Dover, Ohio
- C. Customer/Sponsor The customer for this project is the U.S. Army Corps of Engineers.
- D. Project Description Assessment of all project lands that could be contaminated prior to conducting work on the site. A site assessment of all project lands shall include investigation of adjacent properties from which contamination could migrate. The Assessment shall consist of an environmental site assessment using standard practices to determine the potential for or presence of hazardous, toxic, or radioactive waste (HTRW) or other environmental concerns.

IV. Quality Control Plan.

An effective Quality Control Plan (QCP) is important to the undertaking of this program due to the potential risks that HTRW poses to human health and the environment. An effective QCP will ensure that a high quality technical product will be produced that will require little or no revision prior to a quality assurance review.

V. Internal Quality Control.

Phase I HTRW assessments shall be prepared by a qualified Environmental Professional, CELRH-EC-CE. That individual will be responsible for ensuring a quality product through internal checks, review and interaction with Internal Quality Control Team (IQCT) members assigned to monitor project Quality. The Phase I HTRW assessment is conducted with full communication between team members. Only quality products will be released from the IQCT. All members of the review team will sign a quality certification sheet.

VI. Quality Control (QC) Review Team.

The IQCT shall consist of a Lead Environmental Professional (LEP), Quality Control Environmental Professional (QCEP) and an Environmental Technical Staff (ETS) member. Each member will be responsible for input or review for compliance with established policy and guidelines. The QC review team and their responsibilities are:

- Lead Environmental Professional (LEP), Construction Management & Field Support Branch, Environmental and Remediation Section (CELRH-EC-CE). Performs Phase I HTRW Assessment and review of adequacy, completeness and verification that the Environmental Site Assessment has been conducted in accordance with standard practices, policy, and guidelines.
- Quality Control Environmental Professional (QCEP), Construction
 Management & Field Support Branch, Environmental and Remediation Section
 (CELRH-EC-CE). Review for Precision, Accuracy, Representativeness,
 Comparability (PARCC), completeness and verification that the Environmental
 Site Assessment has been conducted in accordance with standard practices,
 policy and guidelines.
- 3. Environmental Technical Staff (ETS), Environmental and Remediation Section, Construction Management & Field Support Branch (CELRH-EC-CE). Review for hazard, risk assessment and conformance to policies and regulations.

VII. Quality Assurance.

Quality assurance (QA) review of Phase I HTRW Investigations executed by CELRH-EC-CE or their A-E that recommends a Phase II HTRW Investigation will be conducted by the ERDC.

Phase I reports that are prepared by CELRH-EC-CE will be on file in the district office. Reports that contain questionable findings or recommendations for Phase II will be sent to the ERDC for QA review.

VIII. Project Schedule (Project File)

The Project Schedule will be completed on a project by project basis and placed in the project file.

IX. QC Certification

The QC Certification will be completed on a project by project basis and placed in the project file.

QUALITY CONTROL DOCUMENTATION

Supplement to Generic QC/QA Plan

Dover Dam Safety Assurance Project

This supplements the Huntington District Programmatic QC/QA Plan for HTRWOE Products with specific information described below. The checklist in the CELRH Programmatic QC Plan for products should be used to guide reviewers.

Project Title: Dover Dam Safety Assurance Project

Date: October 30, 2006

Product(s): Phase I HTRW Environmental Site Assessment on all Contract Work Limit

Areas

Customer Organization & Point of Contact: U.S. Army Corps of Engineers

Project Description: Dam Safety Assurance

Project Manager: Rodney Cremeans

Lead Environmental Professional: Nickolas McHenry

Product Team: (If applicable, individuals performing the work.)

NAME ORGANIZATION OFFICE SYMBOL DISCIPLINE

Nick McHenry USACE CELRH EC-CE Env. Engineer

Independent Technical Review Team (ITRT): (Individuals performing independent review.)

NAME ORGANIZATION OFFICE SYMBOL DISCIPLINE

Janet Wolfe USACE CELRH EC-CE Chemist

Ken Woodard USACE CELRH EC-CE Environmental Engr.

QA Examination Tea products as well as the	am: (Applies <u>ONLY</u> to nose products of similar	Phase II ESA products r technical complexity.	s and Category B
NAME	ORGANIZATION	OFFICE SYMBOL	DISCIPLINE
	A		
		-	-
-		-	

APPROVED BY:

LISA A. HUMPHREYS

Chief, Environmental and Remediation Section

Quality Control Review Certification

Dover Dam Safety Assurance Project

Project Title: Dover Dam Safety Assurance Project

Date: October 30, 2006

Product: Phase I HTRW Environmental Site Assessment on all Contract Work Limit

Areas

Lead Environmental Professional: Nickolas McHenry

In accordance with the Huntington District ISO Procedure 3.36, independent review for the identified product has been completed and all comments are resolved. The following ITRT members certify completion of the review and resolution of comments:

NAME

DISCIPLINE

INITIALS

Frank Albert

Environmental Engineer

Janet Wolfe

Chemist

Summary of issues resolved by the Chief of the Environmental and Remediation Section or responsible individual:

Lead Environmental Professional:

(Signature)

(Date)

HTRWOE Checklist

for

Dover Dam Safety Assurance Project

Project Title. Dover Dain Safety Assurance Project
Date: October 30, 2006
Product(s): Phase I HTRW Environmental Site Assessment on all Contract Work Limits
Lead Environmental Professional: Nickolas McHenry
This checklist is intended to serve as a general guide for review of HTRWOE products. This checklist is not all inclusive and it is not intended to substitute for sound judgment of experienced professionals.
1 The product is organized in the proper format. Paragraphs and pages are numbered correctly.
2. The text is legible and letter perfect. Language is direct and unambiguous
3. All acronyms are spelled out the first time used in the text.
4. Referenced documents and reports are available for review.
5. Technical language used in the document/report is standard in the environmental industry and therefore will be understood by the customer.
6. The work called for in the document/report is appropriate given the current site knowledge and purpose of the effort.
7. Product has been prepared in accordance with standard practices, policy and guidelines
8. None Additional Comments.
(+1.) all

Environmental and Remediation Section

MEMORANDUM OF RECORD (Attention: Nickolas McHenry)

SUBJECT: QC Comments on the October 2006 Draft Phase I Hazardous, Toxic, Radioactive Waste (HTRW) Investigation Report, Dover Dam, Dam Safety Assurance Project, Dover, Ohio.

- 1. A Table of Contents needs to be included in the report.
- 2. Section 1.2, page 6. The last sentence of this section should be completed.
- 3. Section 2, Within the Dam, page 8. Describe procedures for removal of water. Would it be manually pumped out or somehow allowed to automatically drain back into the river? If allowed to drain back into river, this could be a potential source of contaminants to river, if the drain and sumps have held oil.
- 4. Section 2, Left Descending Bank of CWL, page 8. A statement could be included that rules out that the railroad includes(ed) a spur at this point used for loading and unloading.
- 5. Section 2, Proposed Access Road, page 9. The last sentence could reference the list of environmental concerns which are included in Section 5, Recommendations.
- 6. Section 2, Right Descending Bank of CWL, page 7, last bullet. What type of runoff pipes were observed? Is this for stormwater runoff and/or or does it drain into the area of the pit toilets?
- 7. Section 4.5.1, ERGO Reports. The second sentence "In the ERGO Report, Operations conducts..." should be reworded for clarity. You could state something like "According to the ERGO Reports, Operations conducts...".
- 8. Section 4.6, Review of Federal and State Regulatory Records. You could include a statement at the end of this section discussing the additional databases that aren't listed in this section (US Brownfields, US Eng Controls, etc.)
- 9. Section 5, Recommendations. You could include a list of potential sampling parameters in the recommendations.
- 10. Attachment 6. The subsections of the attachments could be divided with different colored sheets.
- 11. Attachment 6, Interview Summary with Nick Krupa, Comment No. 11. You could include information on the type of waste that is generated.

- 12. Attachment 6, ERGO Reports, Cycle II ERGO Report, page 6. The site may contain a chlorine tank used to treat water. You could check this out, and if so, include in your description of the site.
- 13. Attachment 6, ERGO Reports, Cycle III ERGO Report, 1st page. You could describe in greater detail in the report what liquid chemicals, lubricants, etc. are stored in the dam area as well as at other on-site locations. (ex., chlorine, hydraulic oil, diesel fuel, gasoline, cleaning solvents, etc.)
- 14. Attachment 6, ERGO Reports, Cycle III ERGO Report Category XI-Below Dam Area. Fecal coliform could be included in the sampling parameters if the pit toilets are close to the river.
- 15. If you have any questions on the above comments, please let me know.

Janet K. Wolfe

Environmental & Remediation Section

MEMORANDUM OF RECORD (Attention: Janet Wolfe)

SUBJECT: Response to QC Comments on the October 2006 Draft Phase I Hazardous, Toxic, Radioactive Waste (HTRW) Investigation Report, Dover Dam, Dam Safety Assurance Project, Dover, Ohio.

1. A Table of Contents needs to be included in the report.

Res. Concur. Table of Contents have been added as suggested.

2. Section 1.2, page 6. The last sentence of this section should be completed.

Res. Concur. The sentence now reads "As a result of the studies, the USACE is proposing a project that would anchor the dam to bedrock to prevent any dam slippage during a record flooding event."

3. Section 2, Within the Dam, page 8. Describe procedures for removal of water. Would it be manually pumped out or somehow allowed to automatically drain back into the river? If allowed to drain back into river, this could be a potential source of contaminants to river, if the drain and sumps have held oil.

Res. Concur. This section was revised to read: "It was noted during the site visit that hydraulic oil is used to raise and lower the gates of the dam. It was apparent in a few of the gates that they had leaked oil in the past. Approximately 7 feet away from all of the gates is a series of grating. It was obvious that in a few instances the gates which leaked the hydraulic oil did so directly into this grating. The grating also houses the foundation drains of the dam, which act as relief wells during high flow times, allowing water to be pushed up into the dam. Dover Dam personnel said they had never observed the drains leave the pipes into the grating. As it was described to EC-CE personnel, if water were to overflow from the foundation drains and get into the grating the water would be transported back to the river via a sump pump. Even though oil could possibly be released into this grating system, it is unlikely that the oil would be transported to the bedrock underneath the dam via the foundation drains due to the fact that water has not reportedly overtopped the foundation drains."

4. Section 2, Left Descending Bank of CWL, page 8. A statement could be included that rules out that the railroad includes(ed) a spur at this point used for loading and unloading.

Res. Concur. I tried to make contact with local railroad companies to gather information concerning the use of the railroad in this area, but they did not return calls. Due to the accelerated schedule of this report I was forced to just go with the information

that I had at the time the report was due, so that's why there is no further info given concerning the railroad.

5. Section 2, Proposed Access Road, page 9. The last sentence could reference the list of environmental concerns which are included in Section 5, Recommendations.

Res. Concur. The section now reads: "Based on the field investigation there is evidence that the area with abandoned railroad ties may contain environmental concerns that would impact the proposed CWL. Ohio EPA and the receiving landfill require that samples of the railroad ties, and soil where the ties lay, be taken for disposal purposes. Though not considered a hazardous waste, railroad ties are still required to be subjected to Toxicity Characteristic Leaching Procedure (TCLP) analysis prior to disposal at the appropriate facility."

6. Section 2, Right Descending Bank of CWL, page 7, last bullet. What type of runoff pipes were observed? Is this for stormwater runoff and/or or does it drain into the area of the pit toilets?

Res. Concur. This section now reads "At the day use area downstream from the dam, there are restrooms that utilize pit toilets. There were also several stormwater runoff pipes from State Route 800 that empty into this area." I don't believe that the stormwater runoff in this area empties in the direct vicinity of the vault toilets.

7. Section 4.5.1, ERGO Reports. The second sentence "In the ERGO Report, Operations conducts..." should be reworded for clarity. You could state something like "According to the ERGO Reports, Operations conducts...".

Res. Concur. As per the comment from Frank Albert, the sentence now reads as follows "For the ERGO environmental compliance reviews, Operations and Readiness Division conducts a site visit and provides recommendations to ensure that routine project operations are in compliance with all Federal, State, and local environmental laws, regulations, and directives."

8. Section 4.6, Review of Federal and State Regulatory Records. You could include a statement at the end of this section discussing the additional databases that aren't listed in this section (US Brownfields, US Eng Controls, etc.)

Res. Concur. The following paragraph was added at the end of the EDR sections "The following state/federal databases were also accessed but did contain have sites listed in the vicinity of the project site: US ENG CONTROLS, US INST CONTROLS, DOD, US BROWNFIELDS, CONSENT, ROD, UMTRA, ODL, SSTS, ICIS, TOWNGAS, HIST LF, DRYCLEANERS, USD."

9. Section 5, Recommendations. You could include a list of potential sampling parameters in the recommendations.

- Res. Concur. I will get with you to determine which parameters you would recommend for the contaminants that are believed to be present.
- 10. Attachment 6. The subsections of the attachments could be divided with different colored sheets.
- Res. Concur. Colored sheets have been added to separate the individual sections within the Attachment.
- 11. Attachment 6, Interview Summary with Nick Krupa, Comment No. 11. You could include information on the type of waste that is generated.
- Res. Concur. They are listed as a Conditionally Exempt Small Quantity Generator, which means they have an extremely low generation of waste. From what I've seen in the past in dealing with CESQG's is that they generate items such as used lightbulbs, paint, etc. even though I did not get this information from Nick Krupa. I did not see any other waste that could have been generated at the site during my site visit.
- 12. Attachment 6, ERGO Reports, Cycle II ERGO Report, page 6. The site may contain a chlorine tank used to treat water. You could check this out, and if so, include in your description of the site.
- Res. Concur. I believe the chlorine tank was previously used to treat drinking water at the dam prior to USACE personnel discovering that there was a high iron concentration in the water.
- 13. Attachment 6, ERGO Reports, Cycle III ERGO Report, 1st page. You could describe in greater detail in the report what liquid chemicals, lubricants, etc. are stored in the dam area as well as at other on-site locations. (ex., chlorine, hydraulic oil, diesel fuel, gasoline, cleaning solvents, etc.)
- Res. Concur. Information concerning items stored in the dam was given in Section 2.0. These include oil for the gates, diesel fuel for the emergency generators. The only other items that could be noted here were a small amount of cleaning solution located in the dam.
- 14. Attachment 6, ERGO Reports, Cycle III ERGO Report Category XI-Below Dam Area. Fecal coliform could be included in the sampling parameters if the pit toilets are close to the river.
- Res. Concur. The vault toilets are within ~75' of the river, but I'm not sure if there will be any excavation in this area of the project. With this being said I'm not sure if these samples would be warranted, but I included the following Recommendation "Due to the vault toilets being located within the CWL, samples for fecal coliform should be taken to ensure worker safety in the event of excavation near the leach field for these toilets."

If you have any questions on the above responses to your comments, please let me 15. know.

Nickolas McHenry, E.I. Environmental & Remediation Section

HTRWOE Checklist

for

Dover Dam Safety Assurance Project

Project Title: Dover Dam Safety Assurance Project

Date: October 30, 2006

Product(s): Phase I HTRW Environmental Site Assessment on all Contract Work Limits.
Lead Environmental Professional: Nickolas McHenry
This checklist is intended to serve as a general guide for review of HTRWOE products. This checklist is not all inclusive and it is not intended to substitute for sound judgment of experienced professionals.
1 The product is organized in the proper format. Paragraphs and pages are numbered correctly.
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3. All acronyms are spelled out the first time used in the text.
4. Referenced documents and reports are available for review.
5 Technical language used in the document/report is standard in the environmental industry and therefore will be understood by the customer.
6 The work called for in the document/report is appropriate given the current site knowledge and purpose of the effort.
7. Product has been prepared in accordance with standard practices, policy and guidelines
8 Additional Comments. Phase reform to comments
8. Additional Comments. Phone 2 200 C VIA Emil / Memo
Frank Albert, P.E.
Environmental and Remediation Section

MEMORANDUM FOR CELRH-EC-CE, ATTN: Nickolas L. McHenry

SUBJECT: Draft Report for the Phase I Hazardous, Toxic and Radioactive Waste (HTRW) Environmental Site Assessment, Dover Dam, Dam Safety Assurance Project, Dover, Ohio, October 2006 – Quality Control Review Comments

1. The subject report has been reviewed and the following comments are provided:

Table of Contents

- It is noted that the title of the report differs from the title shown on the cover of the report and the inside cover page. You may consider revising one or the other for consistency.
- Comment regarding Appendices. Why are the appendices listed as attachments rather than as appendices in the TOC? Just curious.

Executive Summary

• Investigative Findings & Recommendations, 4th bullet, last sentence. It is noted that TCLP has not been defined. The phrasing could be revised slightly, because TCLP samples are not taken, the railroad tie samples are subjected to TCLP analyses to characterize the ties for disposal at the appropriate facility.

Report Text

- Section 1.2, 2nd paragraph, last sentence. This sentence states "As a result of *the their* studies..." the word *the* or *their* should be deleted.
- Section 1.3
 - o 1st paragraph, 2nd sentence. The date format should be revised to dd/mm/yyyy to match format of other dates.
 - o 1st paragraph, 3rd sentence. This sentence states "During..., physical inspection of the ground surface was *examined* for..." the word *examined* should be replaced with *conducted* or similar word.
- Section 2.0, Left Descending Bank of CWL. The 2nd paragraph does not necessarily have to be "yellow-highlighted".
- Section 4.1, 1st sentence. The date format should be revised to dd/mm/yyyy.
- Section 4.2, 3rd sentence. The reference to *Appendix B* should be *Attachment 2*.
- Section 4.3. Is the last sentence applicable since this was also stated in Section 4.1?
- Section 4.4
 - o 1st and 4th sentences. The 1st sentence states that the spill was approximately 15 miles upstream of the dam and the 4th sentence states the spill was contained 16 miles downstream of the spill site at the dam. One or the other (15 or 16) needs to be revised/verified).
 - o 2nd sentence. The word "and" appears to be needed after "Pipeline". Is Ashland *Pipeline* the correct name or is it Ashland Oil? Just had not heard of the former.

CELRH-EC-CE

SUBJECT: Draft Report for the Phase I Hazardous, Toxic and Radioactive Waste (HTRW) Environmental Site Assessment, Dover Dam, Dam Safety Assurance Project, Dover, Ohio, October 2006 – Quality Control Review Comments

Section 4.5.1.

- o General. ERGO was not defined; also may want to add this to Acronym list.
- 1st section. The term "Operations Branch" is used; this should likely be revised to "Operations and Readiness Division".
- o 2nd sentence. The statement "In the ERGO reports, Operations conducts..." should probably be revised to "During (or For) the ERGO (or environmental) compliance reviews,..." or something to that effect, because the site visits are not conducted In the ERGO reports. Also, recommend that "routine business of the project" be revised to something like "routing project operations".
- Section 4.5.3. The next-to-last sentence is a recommendation and could be deleted.
- Section 4.6.11, 1st paragraph, 2nd sentence. States "...no mapped *SHWS* sites...", this should be "...no mapped *UST* sites"
- Section 4.6.14
 - o 1st paragraph, 1st sentence. The last portion that reads "...which is an index for which our district officers maintain files" does not appear correct wording.
 - o 2nd paragraph. This is written as plural sites, but should be singular, site.

Section 5

- o 2nd bullet, 1st sentence. You could revise "sediment samples" to just "samples", since "river sediments" are then stated. Is the 2nd sentence needed?
- o 4th bullet. It is noted that TCLP has not been defined. The phrasing could be revised; TCLP samples are not taken, the railroad tie samples are subjected to TCLP analyses to characterize the ties for disposal at the appropriate facility.
- Last paragraph. May want to add something after "proceeding"; like,
 "...proceeding with the dam safety assurance project", or "...proceeding with construction of the dam safety assurance project", etc.

Attachment 5

- Cover page. Lisa Humphreys' title should be revised to "Chief"
- o Signatures?
- Section 4.0. Nickolas McHenry needs to be added to the list of Environmental Engineers.
- Section 6.0. The numbering needs to be revised from 10-13 to 1-4.
- O Section 8.0. The numbering needs to be revised from 14-16 to 1-3.
- Section 13.0. There is a section numbered as "1" for the Emergency Contacts; this should likely be 13.2.
- Section 13.3. For the directions, where it is stated "Follow Route 800..." you should state in which direction; i.e., north, south, etc.
- JHA. The JHA didn't print out correctly; the left-had side and bottom were cutoff.
- o Hospital Map. You should note which point is the project location (red) and which point is the hospital location (green).

CELRH-EC-CE

SUBJECT: Draft Report for the Phase I Hazardous, Toxic and Radioactive Waste (HTRW) Environmental Site Assessment, Dover Dam, Dam Safety Assurance Project, Dover, Ohio, October 2006 – Quality Control Review Comments

- Attachment 5, cont'd
 - O Plan Acceptance Form. The statement needs revision, it states "I have read and I attended the have attended...
- Attachment 6, Interview Summary, page 1, Local Officials, Tuscarawas Emergency Response interview section. In the 2nd sentence, the word "Assistanct Director" was misspelled. It is also stated that the interview was conducted at 10:15 AM; however, it is noted that the previous interview was noted as being at 10:15 AM. In "1)", the word "facts" in the last sentence would be "fact".
- 2. Please contact me at ext. 5760 if you have any questions.

FRANK R. ALBERT, Jr., P.E. Environmental Engineer

MEMORANDUM FOR CELRH-EC-CE, ATTN: Frank R. Albert, Jr.

SUBJECT: Response to Quality Control Review Comments of Draft Report for the Phase I Hazardous, Toxic and Radioactive Waste (HTRW) Environmental Site Assessment, Dover Dam, Dam Safety Assurance Project, Dover, Ohio, October 2006

1. The subject Quality Control review comments have been reviewed and the following responses are provided:

Table of Contents

• It is noted that the title of the report differs from the title shown on the cover of the report and the inside cover page. You may consider revising one or the other for consistency.

Res. Concur. Title pages and headers have been changed to correspond to each other.

 Comment regarding Appendices. Why are the appendices listed as attachments rather than as appendices in the TOC? Just curious.

Res. Concur. The section didn't have any tabs that would allow for all of the Appendices that are needed to create this report, so I just used what was available.

Executive Summary

• Investigative Findings & Recommendations, 4th bullet, last sentence. It is noted that TCLP has not been defined. The phrasing could be revised slightly, because TCLP samples are not taken, the railroad tie samples are subjected to TCLP analyses to characterize the ties for disposal at the appropriate facility.

Res. Concur. The text has been changed to read: "Ohio EPA and the receiving landfill require that samples of the railroad ties, and soil where the ties lay, be taken for disposal purposes. Though not considered a hazardous waste, railroad ties are still required to be subjected to Toxicity Characteristic Leaching Procedure (TCLP) analysis prior to disposal at the appropriate facility."

Report Text

• Section 1.2, 2nd paragraph, last sentence. This sentence states "As a result of *the their* studies..." the word *the* or *their* should be deleted.

Res. Concur. The word "their" has been deleted from this sentence.

- Section 1.3
 - o 1st paragraph, 2nd sentence. The date format should be revised to dd/mm/yyyy to match format of other dates.

Res. Concur. Date changed as suggested.

o 1st paragraph, 3rd sentence. This sentence states "During..., physical inspection of the ground surface was *examined* for..." the word *examined* should be replaced with *conducted* or similar word.

Res. Concur. Word changed to "conducted" as suggested.

 Section 2.0, Left Descending Bank of CWL. The 2nd paragraph does not necessarily have to be "yellow-highlighted".

Res. Concur. The section was un-highlighted now reads as follows:

"Left Descending Bank of CWL

The Left Descending Bank of the CWL is bordered by the original Pennsylvania Railroad Line and the Tuscarawas River in the area around Dover Dam. This area is to be included in the CWL for the Dover Dam DSA Project.

- There was an area of dredge material disposed of along the streambank upstream from the dam. It was apparent that the material was put in this location to decant water following dredging from the upstream side of Dover Dam. The water from the discarded dredge material was allowed to flow back over land to the Tuscarawas River from the decant location.
- While excavating to replace a stormwater pipe, project personnel encountered what was believed to be a portion of a power pole. It was unclear whether this pole was just a single instance or a portion of a greater dump area.

Based on the field investigation there is evidence that the area being used to decant the dredge material may contain HTRW concerns that would impact the proposed CWL."

Section 4.1, 1st sentence. The date format should be revised to dd/mm/yyyy.

Res. Concur. Change was made as suggested.

• Section 4.2, 3rd sentence. The reference to *Appendix B* should be *Attachment 2*.

Res. Concur. Change was made as suggested.

Section 4.3. Is the last sentence applicable since this was also stated in Section 4.1?

Res. Concur. Sentence was changed to read "Attachment 6 contains summaries of the interviews conducted for this report and HTRW issues that arose from those interviews."

Section 4.4

o 1st and 4th sentences. The 1st sentence states that the spill was approximately 15 miles upstream of the dam and the 4th sentence states the spill was contained 16 miles downstream of the spill site at the dam. One or the other (15 or 16) needs to be revised/verified).

Res. Concur. The oil spill was 15 miles upstream, so the text has been changed to reflect this.

o 2nd sentence. The word "and" appears to be needed after "Pipeline". Is Ashland *Pipeline* the correct name or is it Ashland Oil? Just had not heard of the former.

Res. Concur. The name of the company is Ashland Oil, and has been changed as such. The "and" has been changed as suggested.

• Section 4.5.1.

o General. ERGO was not defined; also may want to add this to Acronym list.

Res. Concur. ERGO was added to the Acronym list and the definition has been added to the text.

 1st section. The term "Operations Branch" is used; this should likely be revise to "Operations and Readiness Division".

Res. Concur. Change was made as suggested.

o 2nd sentence. The statement "In the ERGO reports, Operations conducts..." should probably be revised to "During (or For) the ERGO (or environmental) compliance reviews,..." or something to that effect, because the site visits are not conducted In the ERGO reports. Also, recommend that "routine business of the project" be revised to something like "routing project operations".

Res. Concur. The sentence now reads "For the ERGO environmental compliance reviews, Operations and Readiness Division conducts a site visit and provides recommendations to ensure that routine project operations are in compliance with all Federal, State, and local environmental laws, regulations, and directives."

Section 4.5.3. The next-to-last sentence is a recommendation and could be deleted.

Res. Concur. Sentence was deleted as suggested.

• Section 4.6.11, 1st paragraph, 2nd sentence. States "...no mapped *SHWS* sites...", this should be "...no mapped *UST* sites"

Res. Concur. Change made as suggested.

Section 4.6.14

o 1st paragraph, 1st sentence. The last portion that reads "...which is an index *for which our district officers* maintain files" does not appear correct wording.

Res. Concur. This phrase has been deleted from the sentence.

o 2nd paragraph. This is written as plural sites, but should be singular, site.

Res. Concur. The tenses in this sentence have been revised to reflect the fact there was only one site.

Section 5

o 2nd bullet, 1st sentence. You could revise "sediment samples" to just "samples", since "river sediments" are then stated. Is the 2nd sentence needed?

Res. Concur. Change made as suggested. The second sentence was deleted.

- o 4th bullet. It is noted that TCLP has not been defined. The phrasing could be revised; TCLP samples are not taken, the railroad tie samples are subjected to TCLP analyses to characterize the ties for disposal at the appropriate facility. Res. Concur. This recommendation was changed to read: "Ohio EPA and the receiving landfill require that samples of the railroad ties, and soil where the ties lay, be taken for disposal purposes. Though not considered a hazardous waste, railroad ties are still required to be subjected to Toxicity Characteristic Leaching Procedure (TCLP) analysis prior to disposal at the appropriate facility."
- Last paragraph. May want to add something after "proceeding"; like,
 "...proceeding with the dam safety assurance project", or "...proceeding with construction of the dam safety assurance project", etc.

Res. Concur. The sentence now reads: "If work plans change to include any areas that were not investigated for HTRW concerns during this investigation, then those areas would require a Phase I HTRW Environmental Site Assessment before proceeding with construction of the dam safety assurance project."

Attachment 5

Cover page. Lisa Humphreys' title should be revised to "Chief"

Res. Concur. Text has been changed to show that Lisa is now the Chief.

o Signatures?

Res. Concur. Plan has been signed as requested.

 Section 4.0. Nickolas McHenry needs to be added to the list of Environmental Engineers. Res. Concur. I included myself as suggested.

Section 6.0. The numbering needs to be revised from 10-13 to 1-4.

Res. Concur. Change made as suggested.

O Section 8.0. The numbering needs to be revised from 14-16 to 1-3.

Res. Concur. Change made as suggested.

 Section 13.0. There is a section numbered as "1" for the Emergency Contacts; this should likely be 13.2.

Res. Concur. Change made as suggested.

Section 13.3. For the directions, where it is stated "Follow Route 800..." you should state in which direction; i.e., north, south, etc.

Res. Concur. The direction south was added as suggested.

 JHA. The JHA didn't print out correctly; the left-had side and bottom were cutoff.

Res. Concur. The JHA will be reprinted and included in the SSHP.

 Hospital Map. You should note which is the project location (red) and which is the hospital location (green).

Res. Concur. Map was redone with locations spelled out.

Plan Acceptance Form. The statement needs revision, it states "I have read and I attended the have attended...

Res. Concur. The statement now reads "I have read and agree to abide by the contents of the Site Safety and Health Plan. I attended the have attended the Safety Briefing for the aforementioned site."

• Attachment 6, Interview Summary, page 1, Local Officials, Tuscarawas Emergency Response interview section. In the 2nd sentence, the word "Assistanct Director" was misspelled. It is also stated that the interview was conducted at 10:15 AM; however, it is noted that the previous interview was noted as being at 10:15 AM. In "1)", the word "facts" in the last sentence would be "fact".

Res. Concur. 1) "Assistant Director" was corrected. 2) The time of the conversation was inserted incorrectly. The conversation took place at 10:45am, not 10:15am (cut and paste error). 3) The word "facts" was changed to "fact" in this sentence.

2. Please contact me at ext. 5909 if you have any questions.

Nickolas McHenry, E.I. Environmental Engineer

ATTACHMENT 5 SITE SAFETY AND HEALTH PLAN

GENERIC SITE SAFETY AND HEALTH PLAN FOR PHASE I ENVIRONMENTAL SITE ASSESSMENTS AND ASBESTOS INSPECTIONS

Prepared by: U.S. Army Corps of Engineers **Huntington District** 502 8th Street Huntington, West Virginia 25701-2070

Prepared by:

Nickolas McHenry, El Date Environmental Engineer

Environmental and Remediation Section

Reviewed by:

Environmental and Remediation Section

Approved by: Jean Read

Chief

Safety Office

1.0 INTRODUCTION

- 1.1 <u>Purpose</u>. The purpose of this Site Safety and Health Plan (SSHP) is to establish personnel protection standards, mandatory safety practices, and procedures for all work conducted in the execution of Phase I HTRW Investigations and Asbestos Inspections. The plan assigns responsibilities, establishes standard operating procedures, and provides emergency procedures while operations are being conducted during these field activities. This SSHP is designed to comply with the USACE Safety and Health Requirements Manual, EM 385-1-1, 03 November 2003.
- 1.2 <u>Policy</u>. The provisions set forth in this SSHP are mandatory for all personnel who perform or assist in the conduct of this work. All personnel must become familiarized with the requirements of this SSHP prior to performance of any Phase I HTRW Investigations and Asbestos inspections. The SSHP shall be amended to be site specific, i.e., show local hospital route, site locations, etc., prior to each new field activity.

2.0 SITE DESCRIPTION AND CONTAMINATION CHARACTERISTICS

- 2.1 <u>General</u>. Sites to be investigated will include residential or commercial properties, civil works sites, former manufacturing facilities, military sites, or work for others sites.
- 2.2 <u>Contamination Characteristics</u>. Investigations and inspections at sites other than typical residential or commercial (non-industrial) shall be performed with extreme caution due to the unknown nature of the contaminants. Contamination may range from minor petroleum contamination (fuel spills, motor oil) or improperly disposed household wastes, to more toxic wastes such as PCBs, heavy metals, dioxins, volatiles, and ordnance. Prior to the site visit, the inspection team shall assess the hazardous and toxic contamination potential for the site and amend this SSHP, as appropriate. It is noted that intrusive sampling, other than sampling for asbestos containing materials (ACM), is beyond the scope of Phase I HTRW Investigations.

Each site shall be thoroughly inspected for any evidence of HTRW contamination, in accordance with the requirements of ASTM E 1528-00. Structures shall be inspected for potential ACM and samples taken and analyzed in accordance with USEPA guidance for this work. The site shall be thoroughly walked over and inspected for any signs of contamination, such as distressed vegetation, partially buried drums, excavation or fill activities, underground storage tanks, soil staining, etc.

3.0 HAZARD/RISK ANALYSIS

3.1 <u>Chemical Hazards</u>. Inspectors could be exposed to a variety of contaminants; however, due to the non-intrusive nature of a Phase I investigation, the likelihood for exposure is very minimal. Inspectors shall not open any drums or underground storage tanks (USTs), nor

disturb any other areas of suspect contamination. If a hazardous or toxic condition is evident or suspected, the team shall immediately cease the investigation and notify the Chief, Environmental and Remediation Section. Re-entry to the site shall not be permitted until the situation has been thoroughly investigated.

ACM inspectors shall reduce the risk of exposure to these materials with the use of safe sampling procedures. Inspectors shall wear appropriate respiratory protection if the suspect material appears to be friable. Friable sampling areas shall be wetted prior to sampling and immediately sealed with a clear lacquer or other encapsulating material following the sampling activity.

3.2 Accident Prevention. The most significant hazards while performing these investigations will be slip, trips, falls, and cuts. These hazards are prevalent due to uneven terrain, weather conditions (rain or snow), dilapidated structures, unstable refuse piles, etc. Inspectors must remain aware of these hazards at all times and shall employ use of the "buddy system" when performing these inspections to reduce the possibility of injury. Inspectors shall also use sound judgment when inspecting a site and shall cease the inspection immediately when human health and safety is jeopardized. Obviously hazardous areas, such as structures with rotten floors, open tanks and drums, confined space entry, etc., will be avoided.

Execution of these field activities will be conducted during both hot and cold temperatures, as well as inclement weather. Investigators shall take such precautions as wearing rain suits, layering clothing for cold weather, or wearing loose-fitting clothing during hot weather. Since these activities are not particularly physically taxing, workers should not experience heat or cold stress. Frequent breaks in the shade or in a warm vehicle will be possible, as well as replenishing oneself with cold or warm fluids as applicable.

Other hazards to be aware of are biological hazards, such as bees, ticks, snakes, etc., as well as vicious animals. Fieldwork shall be abandoned when any of these hazards are present and shall not resume until safe site entry can be made.

- 3.3 <u>Vehicle Operation</u>. Field personnel may require the use of a motor vehicle. All vehicles shall be operated in accordance with EM 385-1-1, 18.B. Key points from the Corps safety manual are:
 - 1. Operators shall exercise defensive driving techniques and have mandatory defensive driving training.
 - Seat belts shall be worn by all occupants.
 - The operator shall have the vehicle under control at all times.
 - 4. Vehicles shall be driven at speeds not greater than the posted legal speed limit, weather permitting.
 - 5. Vehicles shall not be left unattended until the motor has been shut off and the key removed from the ignition.
 - 6. Headlights shall be used from sunset until sunrise and during times of adverse weather or sight conditions.

- 7. All equipment shall be properly secured.
- 8. Vehicle shall be maintained in good working order.
- 9. Personnel shall be clear of traffic when exiting the vehicle.

4.0 STAFF ORGANIZATION, QUALIFICATIONS AND RESPONSIBILITIES

4.1 <u>Staff Organization</u>. The Corps inspection team shall consist of two field workers, environmental engineers or engineering technicians. If ACM sampling is required, one team member shall be certified to conduct this work. Each individual shall be responsible as a site safety and health officer due to the minimal hazards associated with this work. Key personnel for this work include:

Chief, Environmental & Remediation

Lisa Humphreys

Environmental Engineers

Frank Albert, P.E. Nick McHenry, E.I. Ken Woodard, P.E

Chemist

Janet Wolfe

Geologist

Daniel Stark, P.G.

Engineering Technicians

Steve Thompson (Asbestos)

Jo Huff (Asbestos)

Additional personnel may be essential to these work activities, as approved by the Chief, Environmental and Remediation Section.

- 4.1.1 <u>Section Chief's Responsibilities</u>. For job-related injuries which require medical treatment, the Section chief shall accompany the injured employee to the medical treatment facility and explain the employee's regular duties and the availability of "Light Duty" so that the injured employee can return to work as soon as medically possible.
- 4.1.2 Employee's Responsibilities. Employees shall be required to read this SSHP and comply with all aspects contained herein. Employees shall not endeavor to conduct these investigations without use of the "buddy system". Employees shall immediately notify the Chief, Environmental and Remediation Section, of any hazardous or potentially hazardous incident or working situation. Employees shall comply with all property owners' security or clearance requirements. Finally, employees shall comply with a property owner's request to vacate the premises, if so directed, and shall immediately apprise the Section Chief, Environmental and Remediation Section, of this situation.
- 4.1.3 <u>Reporting and Investigation</u>. All accidents shall be reported as soon as possible to the Section Chief. The Branch Collateral Duty Safety Officer shall investigate the accident and recommend any corrective actions on ENG Form 3394, furnished to the Safety Office within 2

working days following the accident.

4.2 Training. All investigators have been trained for HTRW work in accordance with 29 CFR 1910.120(e) and receive an annual eight-hour refresher course in hazardous waste site operations. This training meets the requirements of EM 385-1-1, 28.D. All personnel have received Red Cross-sponsored first aid and CPR training and are qualified to administer minor first aid treatment, which is considered adequate for these investigations. Training documentation is on file at the District office. Additionally, all personnel have received site-specific training as required in EM 385-1-1, 28.D.03. Inspectors involved in sampling suspect ACM have received USEPA-sponsored training that meets the requirements of 40 CFR Part 763 AHERA for purposes of accreditation required under Toxic Substances Control Act (TSCA) Section 206. Asbestos inspectors shall also receive an annual training refresher and license renewal.

5.0 PERSONAL PROTECTIVE EQUIPMENT (PPE)

- 5.1 <u>General</u>. All personnel have been issued their own PPE and received training in the proper use of this equipment. Regular inspections of this equipment are the individual's responsibility. Any defective equipment shall be reported immediately to the Section Chief so that a replacement can be issued. All PPE meets or exceeds the appropriate ANSI standard.
- 5.2 Protection Requirements. The level of protection for these investigations should be Level D. No personnel shall enter a site or situation that requires protection above this level. The minimum requirements for Level D protection are sleeved (long or short) shirts, long trouser pants, and steel-toed safety shoes or boots. Personnel may be required to wear safety glasses with side shields, a hard hat, or protective gloves depending on the work situation (sampling asbestos, entering crawl spaces, etc.). All employees receive regular medical exams to assure that they are physically fit to conduct hazardous waste site investigations in accordance with EM 385-1-1, 05.E. and 29 CFR 1910.120.

6.0 MEDICAL SURVEILLANCE

6.1 General. All employees engaged in HTRW activities are required to enter the District's medical surveillance program, which is executed by the Safety and Occupational Health Office. The program is conducted in accordance with EM 385-1-1, Appendix K and 29 CFR 1910.120 and its appendices. The Safety Office contracts with local licensed Occupational Health physicians who are knowledgeable of the physical requirements for hazardous waste site workers.

A baseline physical exam and assessment is conducted to assure that the employee is physically fit to perform the duties required in hazardous waste site operations. This initial exam includes a complete physical examination of major vital organs, chest x-ray, EKG, complete blood workup, audiogram and pulmonary function tests. The examining physician then furnishes the Safety Office a certification of the employee's ability to perform this work or any restrictions that should be imposed.

Annual exams are then conducted which consist of the physical exam, blood work, audiogram, and pulmonary function tests. A chest x-ray and EKG are conducted every third year, or at the discretion of the Safety Office or examining physician. The District Safety Office maintains the medical files for all hazardous waste site workers for a period of 30 years following employment with the Government. Additional, non-scheduled examinations shall be conducted, given the following conditions:

- 1. After an employee has been subjected to a known acute exposure of a hazardous or toxic material.
- 2. After an employee has been subjected to a potential acute exposure of a hazardous or toxic material.
- 3. At the request of an employee who feels that he has the symptoms of an acute exposure.
- 4. Prior to an employee's return to work following extended absence due to work-related injury or illness.

7.0 MONITORING

- 7.1 Air Monitoring. Due to the non-intrusive nature of these investigations, air monitoring should not be required. Employees shall avoid areas that may be suspect for collection of toxic vapors such as manholes, confined spaces, etc. Sampling for ACM shall be conducted in a controlled manner to eliminate air borne particulates. Employees shall use a respirator as required to conduct this work and shall not allow unprotected field personnel or the public within any exposure areas.
- 7.2 <u>Heat/Cold Stress Monitoring</u>. Due to the short term nature of these field investigations, heat or cold stress related problems should not occur. Employees should be able to perform their limited field activities and then seek comfort within a heated or air conditioned vehicle, in shady areas, in a nearby building, etc.

8.0 STANDARD SAFETY PROCEDURES

Standard safety procedures for these HTRW/ACM activities include the following:

- 1. Employees shall always use the "buddy system".
- 2. Employees shall never open or tamper with drums, containers, USTs, or any other potential sources of hazardous and toxic substances.
- 3. Employees shall use sound judgment when entering potentially dangerous situations, i.e., dilapidated structures, properties with vicious dogs, etc. If any of these situations arise, the investigation shall cease until safe site entry can be made.

9.0 SITE CONTROL

These investigations will be conducted on private, public, and Government property. Site

control will not be under the control of the field personnel on public or private property. Personnel shall be required to maintain control within the vicinity of ACM sampling activities, however, to protect other field workers and the public.

10.0 PERSONAL HYGIENE AND DECONTAMINATION

Personnel shall adhere to the standard safety procedures noted in Section 8.0 and avoid contact with any potentially hazardous or toxic substances. If contact is made with minor contaminants, such as petroleum products, normal washing with soap and water should be adequate. Should contact be made with caustic or acidic substances, the exposed area shall be flushed with water for 15 minutes and the injured worker rushed to the local hospital or other medical facility.

Workers involved with sampling of ACM shall take care to avoid contact with any particulates. If exposure occurs, the affected area shall be washed with soap and water to remove any contamination.

Workers shall always practice good hygiene and be sure to wash their hands prior to eating, drinking, or smoking. They shall also thoroughly wash their face, hands, and any other exposed areas following the conduct of daily field activities.

11.0 EQUIPMENT DECONTAMINATION

The equipment necessary to conduct these field activities includes a camera and asbestos sampling tools. Decontamination of the asbestos sampling tools shall be accomplished by wiping the tool clean after each sampling activity to avoid any cross-contamination between samples. Wiping cloths shall be double-bagged and disposed of in a sanitary landfill.

12.0 EMERGENCY EQUIPMENT AND FIRST AID

All employees engaged in these activities have received Red Cross-sponsored training in minor first aid and CPR. Since the "buddy system" shall be employed during these activities, the requirement in EM 385-1-1 to have two employees on the site certified in first aid and CPR shall be met. The Government vehicle shall be equipped with a first aid kit to treat minor injuries. The first aid kit shall be restocked prior to each field investigation and checked to assure that the contents have remained sterile.

13.0 EMERGENCY RESPONSE

13.1 <u>General</u>. If an emergency arises that involves a major personal injury, fire, or other threat to the surrounding area, local emergency responders shall be contacted. Since these activities may be conducted in remote locations, employees must become familiar with the location of the closest medical facility and the most direct route to that facility.

13.2 Emergency Contacts:

Dover Fire Department (330) 343-5552

Tuscarawas County Sheriff's Department (330) 339-2000

Dover Police Department (330) 364-5533

Tuscarawas Co. Homeland Security &

Emergency Response (330) 308-6670

Ohio State Police (877) 7-PATROL

Smith Ambulance Service (330) 602-0050

13.2 <u>Directions to Hospital:</u>

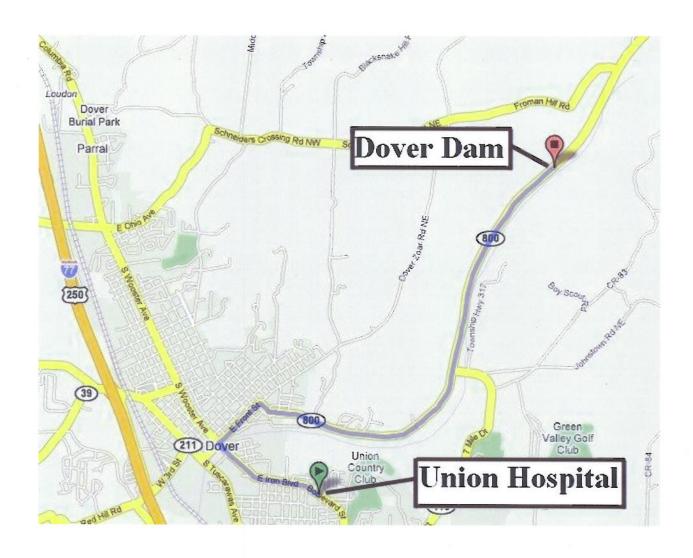
Union Hospital 659 Boulevard Dover, OH 44622 330-343-3311

Follow Route 800 south to Dover, OH, where State Route 800 turns into Boulevard.

APPENDIX A JOB HAZARD ANALYSIS

JOB HAZARD ANALYSIS FOR PHASE I HTRW INVESTIGATIONS & ASBESTOS INSPECTIONS

ſY	HAZARD	REMEDY
	 Inclement weather or visibility hazards. Medication or other drowsiness. Other drivers and traffic. 	 Always wear seat belts; use headlights from dusk to dawn or in fog; obey posted speed limit; slow down as appropriate; apply 2 second rule. Never operate a vehicle if medication causes drowsiness; never drive if you are sleepy or otherwise impaired. Use defensive driving techniques; park your vehicle clear from traffic.
u	 Slip, trip and fall Unknown HTRW Confined spaces Biological and physical hazards 	 Assure firm footing; do not climb unstable slopes; wear protective footwear. Never open drums, containers or underground storage tanks for these investigations. Never enter confined spaces for these investigations. Use tick or insect repellent; do not enter sites with vicious animals.
	 Airborne particulates. Cuts or abrasions. Sample cross-contamination. 	 Adequately wet the sample area prior to sampling; wear respiratory protection as required. Wear protective leather gloves; always use a sharp sampling tool.



 $\frac{Site\ Location\ Map-Union\ Hospital}{Not\ to\ Scale}$

Plan Acceptance Form Site Safety and Health Plan

Project Name: Dover DSA Phase I HTRW Environmental Site Assessment

Location: Dover Dam, Dover, Ohio

I have read and agree to abide by the contents of the Site Safety and Health Plan. I attended the have attended the Safety Briefing for the aforementioned site.

NAME (PRINTED)	OFFICE	SIGNATURE	DATE
NICK MCHEWRY	€C-C E	Themy	10-31-06
20.00			
M.			15
88		6	
6	120		

Person responsible for the safety briefing

SIGNATURE

DATE

ATTACHMENT 6
ESA Investigation Information

Site Visit Pictures

Phase I HTRW Environmental Site Assessment Dover Dam DSA Project Dover, Ohio Proposed Contract Work Limits



Photo 1 – View of Dover Dam.



Photo 2 – View of emergency generator diesel tank.



Photo 3 – View of hydraulic oil tank located in Dover Dam gallery.

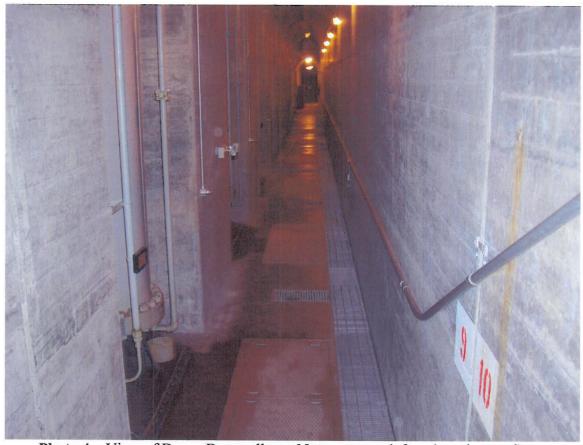


Photo 4 – View of Dover Dam gallery. Note gates on left and grating on floor.



Photo 5 - View of right descending streambank past dam in CWL.



Photo 6 - View of right descending streambank before dam in CWL.



Photo 7 - View of left descending streambank before dam in CWL.



Photo 8 – View of existing access road located along right descending streambank before dam in CWL.



Photo 9 – View of dredge material located along right descending streambank before dam in CWL.



Photo 10 - View of apparent petroleum leaching from dredge material



Photo 11 – View of area where dredge material releases dredge material water back to Tuscarawas River.



Photo 12 – View of right abutment located along right descending streambank before dam in CWL.



Photo 13 – View of discolored rock located above abutment located along right descending streambank before dam in CWL.



Photo 14 – View of approximate area where petroleum was encountered during drilling. This site is located along right descending streambank following the dam in CWL.



Photo 15 – View of approximate area where petroleum was encountered during drilling. This site is located along right descending streambank following the dam in CWL.



Photo 16 – View of vault toilets located along right descending streambank following the dam in CWL.



Photo 17 – View of stormwater pipe located along right descending streambank following the dam in CWL.



Photo 18 - View of island located at the downstream extent of the CWL.



Photo 19 – View of existing access road located along right descending streambank following the dam in CWL.



Photo 20 – View of transformer located along State Route 800.

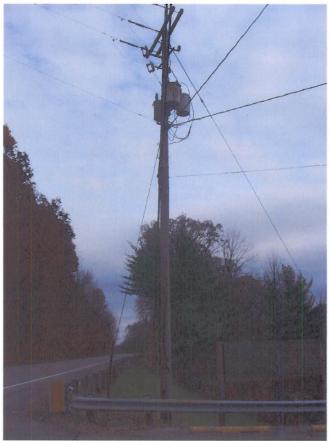


Photo 21 – View of transformer located along State Route 800.



Photo 22 – View of dredged material located along left descending bank above Dover Dam (adjacent to proposed upstream access road).



Photo 23 - View of CWL on the left descending bank below Dover Dam.



Photo 24 - View of CWL on the left descending bank above Dover Dam.



Photo 25 - View of gas line adjacent to proposed access road below Dover Dam.



Photo 26 - View of railroad tie located along proposed access road below Dover Dam.



Photo 27 - View of proposed access road below Dover Dam.



Photo 28 – View of discarded railroad ties located along proposed access road below Dover Dam.

Interview Summaries

Interview Summary

This interview was conducted with Nick Krupa, USACE Muskingum Area, Supervisor on November 2, 2006. The interviews were conducted by Nickolas McHenry.

The following questions/answers were discussed during the interview.

- 1) Is there vehicle maintenance that takes place at the dam? Ans. No
- 2) Is there any hydraulic equipment used at the dam? Ans. The gates use hydraulic oil to raise/lower. There is an emergency generator that has a small diesel tank.
- 3) Do you know of any old dumping areas associated with the dam? Ans. No.
- 4) Have there been any spills, leaks at the site? Ans. No, not since I've been here at the site. There was a record of a oil spill upstream from the dam, but that was 15 years ago.
- 5) It was noted in a meeting that the dam is dredged every 1-2 years. Have there been any concerns noted during dredging? Odors, sheens, etc? Ans. No, not that I know of. The dredged material gets put on the streambank near the dam so the water can decant. Local residents take some of the dredged material for personal use at time.
- 6) Are there any pesticides used at the dam? Are they stored onsite? Ans. We hire a local, licensed contractor to conduct pesticide application around the dam. A water safe formula has been instituted for use at the dam.
- 7) How is wastewater disposed of at the site? Ans. There are vault toilets at the day use area.
- 8) Is there a natural gas line located near the CWL? Ans. Yes, there is a gas line on the opposite side of the river from SR800 along the upper railroad line.
- 9) Have there been any leaks from the natural gas line? Ans. No, but project personnel almost uncovered the line while digging for a water break.
- 10) Is there an emergency power station located at the dam? Ans. Yes, there are two emergency generators located at the dam. One at the gate house and one at the Musk. Area office.
- 11) Does the site operate under a generator status from Ohio EPA? Ans. Yes, I believe it is a Conditionally Exempt Small Quantity Generator.

Interview Summary

Interviews were conducted with local officials in Tuscarawas County, Ohio on October 31, 2006. The interviews were conducted by Nickolas McHenry.

The Ohio State Highway Patrol was contacted in response to the Dover Dam DSA CWL Phase I. Lieutenant Eric Escor, Highway Trooper, was contacted in response to conducting the interview. His interview was used to inform the environmental professionals on information pertaining to the sites. The following questions and answers were submitted during the dialog conducted on the time and date listed above. Phone number used to contact representative is (330) 339-1103. (The interview was conducted at 1:30pm.)

 Do you know of any incidents, spills or accidents in the vicinity of this site that could have caused soil or water contamination?
 Ans. No, not to my knowledge. I've been with the Ohio State Patrol 30 years, and don't' recall any spills we responded to.

The Fairfield Township Volunteer Fire Department was also contacted in response to the investigations concerning the Dover Dam DSA CWL Phase I. Donny Frye (Captain, (330) 859-2311) was contacted as a representative of the fire department. His interview was used to inform the environmental professionals on information pertaining to the sites. The following questions and answers were submitted during the dialog conducted on the time and date listed above. (The interview was conducted at 10:15am.)

 Do you know of any incidents or accidents in the vicinity of this site that could have caused soil or water contamination?
 Ans. No. There haven't been any accidents or spills in that area that would've caused any sort of contamination. I've worked with this fire department since 1984.

The Tuscarawas Emergency Response was also contacted in response to the investigations concerning the Dover Dam DSA CWL Phase I. Pat Housel (Assistant Director, (330) 308-6670) was contacted as a representative of the fire department. Her interview was used to inform the environmental professionals on information pertaining to the sites. The following questions and answers were submitted during the dialog conducted on the time and date listed above. (The interview was conducted at 10:45am.)

1) Do you know of any incidents or accidents in the vicinity of this site that could have caused soil or water contamination?

Ans. Yes, there was a major oil spill that happened in 1995-96 upstream from the dam. Following the spill, the dam was used to stop the flow of oil downstream. We have an extensive file concerning the spill, actions taken, newspaper articles, etc. Other than that the only thing I can think of in that area is the fact that there have been several landslides in the area.

The Ohio Environmental Protection Agency was contacted in response to the railroad ties located on the proposed access roads at the Dover Dam DSA CWL. Dan Sowry, OEPA Biologist, was contacted in response to conducting the interview. His interview was used to inform the environmental professionals on information pertaining to the ties. The following questions and answers were submitted during the dialog conducted on the time and date listed above. Phone number used to contact representative is (614) 644-2972. (The interview was conducted at 4:15pm.)

1) What are the options for disposing railroad ties?

Ans. Railroad ties are not hazardous, but they are regulated under FIFRA. However, if you want to dispose of the ties in a landfill, you must still conduct TCLP Samples to ensure the amount of contaminants that would leach from the railroad ties. It is recommended that if you'd like to dispose of the railroad ties, that you give them to a landscaping company or someone who'd use the ties for what they're intended. Some chemicals of concern associated with the ties include arsenic, chromium, PCPs, and creosote.

2) What are your recommendations for the soil where the railroad ties were used/stored?

Ans. Same information applies for the soil associated with railroad ties. The soil needs to have TCLP Sampling conducted prior to disposal. If the soil is to be used onsite, no sampling is necessary unless it is needed for worker safety.

ERGO Reports

RI OF

DEPARTMENT OF THE ARMY

HUNTINGTON DISTRICT, CORPS OF ENGINEERS 502 EIGHTH STREET

HUNTINGTON, WEST VIRGINIA 25701-2070

REPLY TO

ATTENTION OF:

CEORH-OR-E (200)

MEMORANDUM FOR Thomas G. Gavorcik, Project Supervisor, Dover Lake

SUBJECT: Environmental Compliance Review Executive Summary

Subject Summary is enclosed for your review and action. Request you respond to comments and recommendations regarding findings of non-compliance pertaining to your project only. Findings and comments pertaining to outgrants under the jurisdiction of Real Estate will be administered by Real Estate Division. Your response should be furnished to CEORH-OR-E with a copy to CEORH-OR-R.

Encl

GARY L./WATSON, P.E. Chief,/Operations and Readiness Division

CF:

CEORH-OR-R

CEORH-PD-B

CEORH-RE-M

DOVER DAM AND MASSILLION LEVEE ENVIRONMENTAL COMPLIANCE REVIEW

EXECUTIVE SUMMARY

This report presents the results of an Environmental Compliance Review conducted by District personnel at Dover Dam and Zoar Levee, Zoar, Ohio. The review was based upon the Environmental Review Guide for Operations (ERGO) manual (January 1994), developed by Headquarters, U.S. Army Corps of Engineers (HQUSACE).

BACKGROUND:

An Environmental Compliance Review of Dover Dam was conducted by a multidisciplinary team from the Huntington District on 17 February 1994, under the direction of the District's Environmental Compliance Manager. The purpose of the review was to ensure that routine operations of the site, and out granted facilities, were in compliance with all Federal, State, and local environmental laws and regulations. The scope of the review did not include Superfund Projects because these are specifically excluded from the ERGO program.

Dover Dam is located in Tuscarawas County, Ohio, on the Tuscarawas River, a tributary of the Muskingum River. Construction of the dam closure was completed in August 1936. The dam is located approximately 173.6 miles above the mouth of the Muskingum. Dover Lake is a dry dam used solely for flood control purposes; therefore, the lake area is normally dry. The project area contains a total of 230.57 acres in fee and 14,340.40 acres in flowage easements.

This Environmental Compliance Review considered the twelve major environmental compliance categories, with special emphasis to those pertinent to the site, as determined from an informational questionnaire submitted by site personnel prior to the review. It should be noted that there were no findings nor general comments applicable to Zoar Levee.

Members of the Review Team were:

LuAnne Conley - CEORH-OR-E (Team Leader)
Benjamin Marcum - CEORH-OR-R
Donald Hershfeld - CEORH-PD-B
Frank North - CEORH-LM
Donnie N. McGraw - CEORH-RE-M
Kathy E. Rea - CEORH-PD-F

Dover Lake personnel assisting the Review Team were:

Thomas G. Gavorcik, Project Supervisor Marcia Thompson - Maintenance Worker

The compliance categories considered were:

Category I - Air Emissions Management
Category II - Cultural & Historic Resources Management
Category III - Hazardous Materials Management
Category IV - Hazardous Waste Management
Category V - Natural Resource Management
Category VI - Pesticide Management
Category VII - Petroleum, Oil, & Lubricant Management
Category VIII - Solid Waste Management
Category VIII - Solid Waste Management
Category IX - Special Pollutants Management: Radon, PCBs,
Asbestos & Noise
Category X - Underground Storage Tanks (USTs) Management

Category XI - Waste Water Management Category XII - Water Quality Management

CATEGORY OF FINDINGS

For the purpose of this summary, "comment" and "findings" are described as:

- a. CRITICAL: a finding which requires immediate action to mitigate direct threats to human health, safety, environment, or the site mission.
- b. MAJOR: a finding which requires a relatively large commitment of time, human resources, or financial resources, but poses no immediate threat to human health, safety, environment, or the site mission.
- c. MINOR: a finding which can be addressed with relatively modest expenditures of time, human resources, and/or financial resources.
- d. GENERAL COMMENT: related to a good or poor management practice, but not a violation of any federal, state or local law.

The environmental program at Dover Dam and Massillion Levee is well managed, and no critical findings of non-compliance were noted during this review.

SUMMARY OF FINDINGS OPERATIONS AND READINESS DIVISION

The following summarizes the number and kinds of findings and/or comments for each category pertaining to facilities under the jurisdiction of Operations and Readiness Division:

- CATEGORY I AIR EMISSIONS MANAGEMENT
 No findings, facility in compliance.
- CATEGORY II CULTURAL & HISTORIC RESOURCES MANAGEMENT
 No findings, one general comment.
- CATEGORY III HAZARDOUS MATERIALS MANAGEMENT
 One minor finding and five general comments.
- CATEGORY IV HAZARDOUS WASTE MANAGEMENT
 No findings, facility in compliance.
- CATEGORY V NATURAL RESOURCES MANAGEMENT
 One minor finding, four general comments.
- CATEGORY VI PESTICIDE MANAGEMENT
 No findings, two general comments.
- CATEGORY VII PETROLEUM, OIL, AND LUBRICANTS MANAGEMENT
 No findings, facility in compliance.
- CATEGORY VIII SOLID WASTE MANAGEMENT
 No findings, one general comment.
- <u>CATEGORY IX SPECIAL POLLUTANTS MANAGEMENT RADON, ASBESTOS, PCBs & NOISE</u>

 No findings, facility in compliance.
- CATEGORY X UNDERGROUND STORAGE TANKS (USTS) MANAGEMENT No findings, facility in compliance.
- CATEGORY XI WASTE WATER MANAGEMENT
 No findings, facility in compliance.
- CATEGORY XII WATER QUALITY MANAGEMENT
 No findings, one general comment.

The attached Appendix A contains applicable comments and detailed descriptions of each finding pertaining to Operations and Readiness Division, including recommendations to remedy findings of non-compliance.

APPENDIX A

ENVIRONMENTAL COMPLIANCE REVIEW DOVER DAM & ZOAR LEVEE OPERATIONS AND READINESS DIVISION

CATEGORY II - CULTURAL/HISTORICAL RESOURCES MANAGEMENT

General Comment: Master Plan has not been prepared; therefore, cultural resources policies are not addressed. (Reference ERGO requirement 2-11.) Recommend the District Office consider scheduling and funding for completion of Master Plan.

CATEGORY III - HAZARDOUS MATERIALS MANAGEMENT

Finding Number: DOT/0-94-03-017-1/1 Ranking: Minor

Location: Project Office

Criteria: 40 CFR 370.20 thru 370.28

<u>Comments:</u> MSDS sheets have not been submitted to the local fire department advising them of the hazardous chemicals present at the facility.

Recommendations: Provide local fire department written information on all hazardous chemicals present at the facility.

Action Taken: MSDS sheets were provided to the Fairfield Fire Department on 14 March 1994.

General Comments:

- a. Reference 29 CFR 1910.1200(b)(6). One employee has not received training in the use and care of hazardous chemicals at the project. Training, however, is scheduled in April 1994.
- b. Reference EM 385-1-1, para 11.A.11 and 29 CFR 1910.106(d)(5)(i). Paint Locker Store gasoline cans a maximum distance from doorways. NOTE: This was done on 22 February 1994.
- c. Reference DODR 4145.19-1, para 5-404i and EM 385-1-1, para 12.D.09. Paint Storage Building paint cans need new labels indicating flammable liquids. NOTE: Paint cans were labeled on 22 February 1994.

CATEGORY III - (Cont'd)

- d. Reference 29 CFR 1910.106(d)(4). Intake Structure must provide secondary containment for hazardous materials. NOTE: This was done on 18 February 1994.
- e. Reference EM 385-1-1, para 21.D.03 through 21.D.13, and 21.D.17. Garage Remove gages from oxygen /acetylene tanks and cap when not in use.

CATEGORY V - NATURAL RESOURCES MANAGEMENT

Finding Number: DOT/0-94-05-004-1/1 Ranking: Minor

Location: Project Office

Criteria: ER 1130-2-435, Paras 5, 8, 9.

Comments: No Master Plan has been written for Dover Dam.

Recommendations: District Office should schedule and fund preparation of these Master Plans. Planning Division has the lead.

Action Taken:

General Comments:

- a. Reference ER 1130-2-400, para 6 and paras 9 through 11 and Appendix B. Project Office Dover Dam has been incorporated into one "umbrella type" OMP prepared for the thirteen original Muskingum Area projects. The plan has been submitted to the Huntington District Office and forwarded to Ohio River Division.
- b. Reference ER 1130-2-400, para 11(1). Project Office Due to the small amount of acreage surrounding this facility and the lack of extensive forest cover, forest management for the sustained production of timber is not done. Some limited tree planting has been done. When trees are planted, it is done in an effort to enhance aesthetics, control erosion, etc.
- C. Reference ER 1105-2-50, Chapter 2. Project Office There is no active or ongoing wildlife management program at Dover Dam. This is principally due to the relatively small amount (approximately 146 acres at the dam site) of Corps-owned lands. However, some forms of indigenous wildlife (e.g. small mammals and birds) are benefitted, in that Corps ownership of this land prevents the destruction of their habitat such as might occur under private ownership.

CATEGORY V - (Cont'd)

d. Reference 50 CFR 402.01(a), 402.10, 402.12, and ER 200-2-2, para 9. Project Office - There are no known endangered species inhabiting project lands or waters. This is based upon a conversation with Mr. Ken Miltrer of the U.S. Fish and Wildlife Service at Reynoldsburg, Ohio, and a review of a 1991 listing of Federally Endangered and Threatened Species for the State of Ohio.

CATEGORY VI - PESTICIDE MANAGEMENT

General Comments:

- a. Project Office Project has a copy of ER 1130-2-413, Project Operations, Pest Control Program for Civil Works Projects. Should any other regulations or information be required, it can be obtained from either the Area Office or the Huntington District Office.
- b. Reference 40 CFR 171.9, ER 1130-2-412, para 6(a), and ER 1130-2-413, paras 6(b), 7(c) and 8(d). Project Office Project administers their pesticide program in accordance with guidance from the Huntington District Pesticides Control Officer. However, recommend that on future applications of herbicides at dam and levees, the project staff (when inspecting these contractor performed services) complete the inspection checklist, ORH Form 2773a, for herbicide applications.

CATEGORY VIII - SOLID WASTE MANAGEMENT

General Comment: Reference ER 1165-2-116, para 3. Project and Area Offices - Make sure municipal/office wastes are disposed of in a licensed, state approved landfill. File a copy of the permit, letter from state, etc. in the MARKS 200 file.

CATEGORY XII - WATER OUALITY MANAGEMENT

General Comment: Reference EM 385-1-1, para 03.A.08. Project/Area Office - To prevent any potential cross-connection, backflow preventor valves should be placed on all spigots with threads.

SUMMARY OF FINDINGS REAL ESTATE DIVISION

The following summarizes the number and kinds of findings and/or comments for each category pertaining to facilities under the jurisdiction of Real Estate Division:

- CATEGORY I AIR EMISSIONS MANAGEMENT
 No findings, facility in compliance.
- CATEGORY II CULTURAL & HISTORIC RESOURCES MANAGEMENT
 No findings, facility in compliance.
- CATEGORY III HAZARDOUS MATERIALS MANAGEMENT
 No findings, facility in compliance.
- CATEGORY IV HAZARDOUS WASTE MANAGEMENT
 No findings, facility in compliance.
- CATEGORY V NATURAL RESOURCES MANAGEMENT No findings, facility in compliance.
- CATEGORY VI PESTICIDE MANAGEMENT
 No findings, facility in compliance.
- CATEGORY VII PETROLEUM, OIL, AND LUBRICANTS MANAGEMENT
 No findings, facility in compliance.
- CATEGORY VIII SOLID WASTE MANAGEMENT
 No findings, facility in compliance.
- CATEGORY IX SPECIAL POLLUTANTS MANAGEMENT RADON, ASBESTOS, PCBs & NOISE

 No findings, one general comment.
- CATEGORY X UNDERGROUND STORAGE TANKS (USTS) MANAGEMENT
 No findings, facility in compliance.
- CATEGORY XI WASTE WATER MANAGEMENT
 No findings, facility in compliance.
- No findings, one general comment.

The attached Appendix B contains applicable comments and detailed descriptions of each finding pertaining to Real Estate Division (Outgrants), including recommendations to remedy findings of non-compliance.

CELRH-OR-E (200)

MEMORANDUM FOR Thomas B. Gavorcik, CELRH-OR-DOT

SUBJECT: Cycle II Environmental Compliance Review

- 1. Enclosed is the report for the Cycle II Environmental Compliance Review conducted at your project on 23 April 1998. I realize corrective actions may have been taken already, particularly, in response to the outbrief conducted at the conclusion of the assessment review. Some actions may still be necessary or may require long-term planning.
- 2. Please review the enclosed report and respond to the comments and findings by March 1999. You should indicate how you've addressed the recommendations or how you propose to address the recommendations, whichever is appropriate. I'd like for you to send your response to CELRH-OR-E so we can include your information as a part of our database.
- 3. The points of contact are Ms. Sheryl L. Morris Meyer, (304) 529-5150, or Mr. Thomas W. Olson, (304) 529-5147. Any questions or comments should be directed to Ms. Morris Meyer or Mr. Olson.

Encl

Chief, Operations and Readiness Division

CF:

CELRH-LM, North

CELRH-OR-E, Krupa

CELRH-OR-MUR

CELRH-OR-T, Marcum

CELRH-PD-E, Maslowski

CELRH-RM-M

CELRH-SO, Read

Dover Dam Cycle II Environmental Compliance Review

Executive Summary

A Review Team, consisting of Huntington District personnel, conducted the Cycle II Environmental Compliance Review at Dover Dam. This review was based upon the Environmental Review Guide for Operations (ERGO), dated March 1994 and developed by Headquarters, U. S. Army Corps of Engineers (HQUSACE). Our findings and recommendations are presented in this report.

add a

Methodology

section in On 21 April 1998, a multidisciplinary team from the Huntington District conducted an environmental compliance review of Dover Dam. An initial review (Cycle I) was conducted on Phone I 17 February 1994, and our team analyzed the findings of that review to determine the status of corrective actions and how to remediate problems. The purpose of this review was to ensure that routine operations of the project complied with all Federal, State and local environmental laws and regulations.

Background

Dover Dam is located on the Tuscarawas River, a tributary of the Muskingum River, in Tuscarawas County, Ohio. Construction of the dam was completed in August 1936. The dam is any located 173.6 miles above the mouth of the Muskingum River. It's a dry dam used solely for flood control purposes; therefore, the lake area is normally dry. The project area contains approximately 230 acres in fee and 14,340 acres in flowage easements.

During this environmental compliance review, the team considered the twelve major environmental compliance categories, with special emphasis to those pertinent to the project. The team members were:

> Sheryl L. Morris Meyer, CELRH-OR-E, Team Leader Nicholas E. Krupa, CELRH-OR-E Benjamin W. Marcum, CELRH-OR-T Robert W. Maslowski, CELRH-PD-E Frank W. North, CELRH-LM Jean L. Read, CELRH-SO

Those assisting the team included Thomas G. Gavorcik, Jim Hicks and Darrel Adkins from Dover Dam and David W. Thomas from the Muskingum Area Office.

The following compliance categories were considered during our review:

Category I - Air Emissions Management Category II - Cultural and Historic Resources Management Category III - Hazardous Materials Management

Category IV - Hazardous Waste Management

Category V - Natural Resource Management

Category VI - Pesticide Management

Category VII - Petroleum, Oil, and Lubricant Management

Category VIII - Solid Waste Management

Category IX - Special Pollutants Management: Radon, Asbestos, Polychlorinated

-

biphenyls (PCBs), and Noise

Category X - Underground Storage Tank Management

Category XI - Wastewater Management

Category XII - Water Quality Management

Category of Findings

For the purpose of this summary, "comments" and "findings" are described as:

- a. CRITICAL: a finding, which requires immediate action to mitigate direct threats to human health, safety, environment, or the site mission.
- b. MAJOR: a finding, which requires a relatively large commitment of time, human resources, or financial resources, but poses no immediate threat to human health, safety, environment, or the site mission.
- c. MINOR: a finding, which can be addressed with relatively modest expenditures of time, human resources, and/or financial resources.
- d. GENERAL COMMENT: related to a good or poor management practice, but not a violation of any federal, state, or local law.

The environmental program at Dover Dam is well managed, and no critical or major findings of non-compliance were noted during this review.

Summary of Findings Dover Dam, Operations and Readiness Division

The following summarizes the number and kinds of findings and/or comments for each category pertaining to facilities under the jurisdiction of Operations and Readiness Division:

<u>CATEGORY I - AIR EMISSIONS MANAGEMENT</u>

No findings, project in compliance.

CATEGORY II - CULTURAL & HISTORIC RESOURCES MANAGEMENT No findings, one general comment. Project in compliance.

CATEGORY III - HAZARDOUS MATERIALS MANAGEMENT No findings, project in compliance.

CATEGORY IV - HAZARDOUS WASTE MANAGEMENT No findings, project in compliance.

<u>CATEGORY V - NATURAL RESOURCES MANAGEMENT</u> One finding, two general comments.

CATEGORY VI - PESTICIDES MANAGEMENT

No findings, two general comments.

<u>CATEGORY VII - PETROLEUM, OIL, AND LUBRICANTS MANAGEMENT</u> No findings, project in compliance.

<u>CATEGORY VIII - SOLID WASTE MANAGEMENT</u> No findings, project in compliance.

<u>CATEGORY IX - SPECIAL POLLUTANTS MANAGEMENT - Radon, Asbestos, Polychlorinated Biphenyls (PCBs) and NOISE</u>

No findings, two general comments. Project in compliance.

<u>CATEGORY X - UNDERGROUND STORAGE TANK MANAGEMENT</u> No findings, project in compliance.

<u>CATEGORY XI - WASTEWATER MANAGEMENT</u> No findings, project in compliance.

CATEGORY XII - WATER QUALITY MANAGEMENT

No findings, three general comments.

The attached Appendix A contains applicable comments and detailed descriptions of each finding pertaining to Dover Dam, Operations and Readiness Division, including recommendations to correct findings of non-compliance.

Appendix A

Environmental Compliance Review Dover Dam Operations and Readiness Division

CULTURAL AND HISTORIC RESOURCES MANAGEMENT

General Comment: A copy of the Historic Properties Management Plan, Letter Report, was provided to Mr. Gavorcik during our review.

<u>CATEGORY V - NATURAL RESOURCES MANAGEMENT</u>

Finding Number: DOT/O-98-05-004/1-1 Ranking: Minor

Location: Project Office

Criteria: EO 1130-2-435

<u>Conditions/Comments</u>: Master plans are required to be developed and kept current for all Civil Works projects and other fee owned lands for which the Corps has administrative responsibility for management. During our Cycle I review, it was noted that no master plan had been written for the fourteen Corps-managed Muskingum projects, including Beach City Lake. As of this review, there has been no change in the status of the finding reported in the Cycle I report.

<u>Recommendations/Corrective Action Plan</u>: It is recommended that the Huntington District schedule and fund preparation of the master plan.

Action Taken: To date, no action has been taken, but it is recommended that the plan be developed as required and when funds are available through the budgetary process.

General Comments:

- a. Water resources projects are required to develop and maintain a project operational management plan. Since the Cycle I review, Dover Dam has been incorporated into an approved "umbrella-type" OMP for the Muskingum area projects.
- b. During the Cycle I review (reference general comments b, c, and d of the Cycle I report), it was noted that only a minimal amount of fee acreage, 146 acres, had been retained adjacent to the dam, thereby, limiting active forest, wildlife and endangered species management. Essentially, there has been no change in the status of the general comments noted during the Cycle I review.

<u>CATEGORY VI – PESTICIDES MANAGEMENT</u>

General Comments: Comments "a" and "b" of the Cycle I report respectively addressed the availability of current regulatory guidance regarding the use of pesticides and inspection of contractor-performed pesticide services. During the Cycle II review, the project was provided a copy of ER 1130-2-540, which supersedes ER 1130-2-413. As recommended during the Cycle I review, the project staff documents the application of pesticides through the completion of CEORH Form 2773a, Herbicide Application Inspection Checklist, plus contractors providing pesticide services, also, are completing ORD Form 1031, Pesticide Application Record.

<u>CATEGORY IX – SPECIAL POLLUTANTS MANAGEMENT: Radon, Polychorinated biphenyls, asbestos and noise</u>

General Comments:

- a. The triennial noise survey was completed in FY 97, with the next survey scheduled for FY 2000. All noise-hazardous equipment is marked as required.
- b. The initial results of the district-wide radon testing program in 1989 (or 1990) indicated levels above 4 pci/l at the intake structure (4.4, 4.2) and office (4.1). Twelve-month long-term re-testing was conducted in both areas (March 1991 to March 1992). Readings in the office area were 3.6 pci/l, which is below the accepted standard. Readings in the intake structure were 7.6 pci/l. Since the standard is based on 24-hour occupancy, and no guidance has been issued for structures, such as intakes, which have limited occupancy, this area has not been mitigated, and at present, there are no plans for mitigation.

CATEGORY XII - WATER QUALITY MANAGEMENT

General Comments:

- a. Below Dam Day Use Area. The water system at the public use area is the only permitted water system on the project, and although not required by the conditions of the permit, the water is chlorinated in order to provide a greater level of protection. In order to ensure the well is not under the influence of surface water, a raw sample should be taken before the system is started for the season. This should be taken from the wellhead and analyzed for the presence of bacteria. Additionally, during the operating season, project personnel should record (in their log) the free chlorine residual in the finished water and annotate whenever fresh chlorine is added to the dosing tank. Chlorine begins to lose its effectiveness over time and should not be allowed to remain in the tank longer than two weeks.
- b. <u>Dover Dam Project Office</u>. The project office was tested for lead in 1994 and was found to have 0.022 mg/l in first run samples and 0.160 mg/l in flush samples. The action level for lead is 0.015 mg/l. As a result, both the project office and the Muskingum Area Office switched to bottled water for all drinking purposes, however, no signs were posted with warnings to the

public regarding the lead content of the water. We recommend obtaining standard signs as depicted in Chapter 11, page 11.6 of the sign manual. The signs should be of the notice type and posted at all outlets to the system. The suggested wording would be "Non-Potable Water, High Lead Content".

c. <u>Dover Dam Project Office</u>. The water softener, leased from a local dealer, does not have a blending valve to mix raw and softened water, in order to achieve the desired hardness of between 120-150 mg/l. Overly softened water is corrosive to the distribution system and may contribute to high lead levels. Also, it is not as healthy as water with some degree of hardness. We recommended the installation of a iron removal filter, which has since been installed.

DOVER DAM

Environmental Compliance Review
Cycle III
Executive Summary

GENERAL:

This report presents the results of an Environmental Compliance Review conducted by District personnel on 29 May 2003, at the Dover Dam (CELRH-OR-DOT) project. Previous Environmental Compliance Reviews, Cycle I on 17 February 1994 and Cycle II on 23 April 1998, were referenced during this review. The review was conducted under the protocols of The Environmental Assessment and Management (TEAM) guide, developed by USACERL (Special Report EC 95/05, November 1994). This review is to ensure that routine business of the Operations project, as well as all outgranted facilities, are in compliance with all Federal, State and local environmental laws, regulations, and directives.

This "External" Environmental Compliance Review provides an environmental "snapshot in time;" in this case 29 May 2003, and will not reflect improvements made since that time by the project; it documents what the conditions were at the time the assessment was undertaken. This provides a record of the environmental health of the project on the record date, as well as providing a basis against which progress can be measured. For the next four fiscal years, Dover Dam will undergo an annual "Internal" Assessment, which documents progress made against any findings in this report, lists any new findings since this report, and addresses the status of any uncorrected findings.

BACKGROUND:

Dover Dam is located in Tuscarawas County, Ohio, on the Tuscarawas River, a tributary of the Muskingum River, approximately 173.6 miles above the confluence of the Muskingum River with the Ohio River. Construction of the dam closure was completed in August 1936. Dover is a "dry" dam used solely for flood control purposes (therefore the ponding area is normally dry). The project area contains a total of 713.45 acres in fee and 8,309.57 acres in flowage easements.

PROCEDURE AND PERSONNEL:

This Environmental Compliance Review considered the twelve major environmental compliance categories, with special emphasis to those pertinent to the site. It was conducted by a team effort of trained Operations and Real Estate personnel from the District Office, and Dover Dam project personnel. Members of this team review were:

Denis Chabot, PE, Environmental Engineer – CELRH-OR-E (Team Leader) Kevin Osborne, Environmental Engineer – CELRH-OR-E

Assisting from the Dover Dam project was:

Thomas G. Gavorcik, Maintenance Mechanic - CELRH-OR-DOT

Assisting from the Muskingum Area Office was:

Stanlee A. Rosenblatt, Park Ranger – CELRH-OR-MUR Gary Baxter, Realty Specialist – CELRH-RE-ME

COMPLIANCE CATEGORIES:

The compliance categories considered were:

Category I – Air Emissions Management

Category II - Cultural & Historic Resources Management

Category III - Hazardous Materials Management

Category IV - Hazardous Waste Management

Category V – Natural Resource Management

Category VI – Pesticide Management

Category VII - Petroleum, Oil, & Lubricant Management

Category VIII - Solid Waste Management

Category IX - Special Pollutants Management: Radon, PCB's, Asbestos & Noise

Category X – Underground Storage Tanks (USTs) Management

Category XI - Waste Water Management

Category XII - Water Quality Management

CATEGORY OF FINDINGS:

For the purpose of this summary, and "findings" and "comments" are described as:

- a. **SIGNIFICANT:** A finding requiring immediate action to mitigate direct threats to human health, safety, environment, or the site mission.
- b. **MAJOR:** A finding which requires a relatively large commitment of time, human resources, or financial resources, but poses no immediate threat to human health, safety, environment, or the site mission.

- c. **MINOR:** A finding that can be addressed with relatively modest expenditures of time, human resources, and/or financial resources.
- d. **GENERAL COMMENT:** A comment on a positive (good) or poor management practice, but one that is not a violation of any federal, state or local law.

SUMMARY OF FINDINGS:

The environmental program at Dover Dam is well managed, and no Significant, Major or Minor findings of non-compliance were noted at the project site during this review. 5 comments of a general nature (plus 4 positive comments) are found within.

APPENDICES (SPECIFIC FINDINGS) FOR OPERATIONS PROJECTS:

Appendix A-1 provides a summary of specific findings by category for Corps facilities at Dover Dam under the management of Operations and Readiness Division personnel. The Appendix indicates that the environmental program at this location is well managed, and no Significant, Major, or Minor findings of any non-compliance were noted during this review.

Appendix A-2 contains detailed descriptions of the 5 general comments pertaining to the Dover Dam project. In addition, each finding or comment contains a recommended corrective action. Note that the recommendation is just that of the team members, and Dover Dam's Maintenance Mechanic is encouraged to solicit other ideas or implement local ideas towards these improvements.

APPENDIX A - 1

SUMMARY OF FINDINGS **DOVER DAM**OPERATIONS AND READINESS DIVISION

The following summarizes the number and types of findings or comments for each category pertaining to facilities under the responsibility of the Operations and Readiness Division:

- Category I Air Emissions Management No findings, facility in compliance
- <u>Category II Cultural & Historic Resources Management</u> No findings, facility in compliance
- <u>Category III Hazardous Materials Management</u>
 No findings, 2 general comments, 1 positive comment
- Category IV Hazardous Waste Management No findings, facility in compliance
- Category V Natural Resource Management No findings, facility in compliance
- <u>Category VI Pesticide Management</u>

 No findings, facility in compliance, 1 positive comment
- Category VII Petroleum, Oil, & Lubricant Management
 No findings, facility in compliance
- Category VIII Solid Waste Management
 No findings, facility in compliance
- <u>Category IX Special Pollutants Management: Radon, PCB's, Asbestos & Noise</u> No findings, facility in compliance
- <u>Category X Underground Storage Tanks (USTs) Management</u>
 No findings, facility in compliance
- Category XI Waste Water Management
 No findings, 2 general comments, 1 positive comment
- Category XII Water Quality Management
 No findings, 1 general comment, 1 positive comment

APPENDIX A - 2

DETAILED FINDINGS & REMEDIES ENVIRONMENTAL COMPLIANCE REVIEW DOVER DAM OPERATIONS AND READINESS DIVISION

CATEGORY III - HAZARDOUS MATERIALS MANAGEMENT

Location: Dam

General Comment: The dam is currently being used as secondary containment for all liquid chemicals, oils or lubricants used or stored within the dam that cannot practically have secondary containment in any other manner. The only concern in this event is with the sumps. Project personnel indicate that the sump pumps are placed on manual operation mode; and are manually energized after an inspection of the sumps is made for the presence of any liquid compound other than water. **Recommend** that this practice of inspecting the sumps for contaminants prior to turning on pumps must absolutely continue, and no short cuts to the inspection process must ever be taken. *Note: This comment documents the presence of a Good Management Practice*.

Locations:

1) F.O.P. Lodge; LP gas tank 2) Equipment Storage Building

General Comment/Recommendation: No placards were observed for the LP gas tank located behind the lodge or for a propane tank at the Equipment Storage Building. OSHA 1926.151 states that "smoking shall be prohibited at or in the vicinity of operations which constitute a fire hazard, and shall be conspicuously posted 'No Smoking or Open Flame.'" **Recommend** that these signs be posted on or near the LP gas tanks.

Location: Oil Storage Building

General Comment/Recommendation: The project has a system in place where hazardous materials products are marked with a number which corresponds to a similarly marked MSDS sheet (*Note: Good Management Practice*). However, when randomly checking to see if the corresponding MSDS sheet could be found for a specific product, the system did not work. **Recommend** that a new inventory be conducted and the MSDS sheets be reviewed and reorganized.

CATEGORY VI - PESTICIDE MANAGEMENT

Location: Office

General Comment: The ERGO team discussed the application of pesticides and the importance of the submission of annual application reports to the Pesticide Control Officer. Dover Dam's Maintenance Mechanic stated that for calendar year 2003, no pesticides were going to be used at the project, and that he would be submitting a negative report to the Pesticide Control Officer. Note: This documents that Dover Dam is Utilizing Good Management Practice.

CATEGORY XI - WASTE WATER MANAGEMENT

Location: Project Office, Septic Tank

General Comments:

- 1) When the ERGO team examined the septic tank, they noticed that the chlorinator unit for the original sewage treatment system was still in place.
- 2) It is suspected that there is a subsurface sand filter in use after the septic tank. No outfall has ever been noticed. The team has determined that this situation is acceptable, since the water is being treated through percolation into the substrata. There is a letter from USEPA Region V in 1977 granting the Huntington District's request to eliminate the permitted discharge at Dover, which may pertain to this system.

Recommendations:

- 1) Recommend that the project staff remove the chlorinator unit.
- 2) **Recommend** that the project continue to monitor the hillside where the outfall from the subsurface sand filter would be expected to be located. If any unusual wet areas are noticed, please contact OR-E immediately.

Location: Below Dam Area (Day-Use Area)

General Comment: Currently there are two pit toilets downstream in the Day-Use Area. The project personnel would like to replace the pit toilets with a septic tank system. **Recommend** that the project continue to pursue this idea, and get this project onto the approved work plan. At an appropriate time (approximately 12 months prior to construction), the project should contact OR-E (Attn: Kevin Osborne) for technical assistance with the project. Note: This documents that Dover Dam is Utilizing Good Management Practice.

<u>CATEGORY XII – WATER QUALITY MANAGEMENT</u>

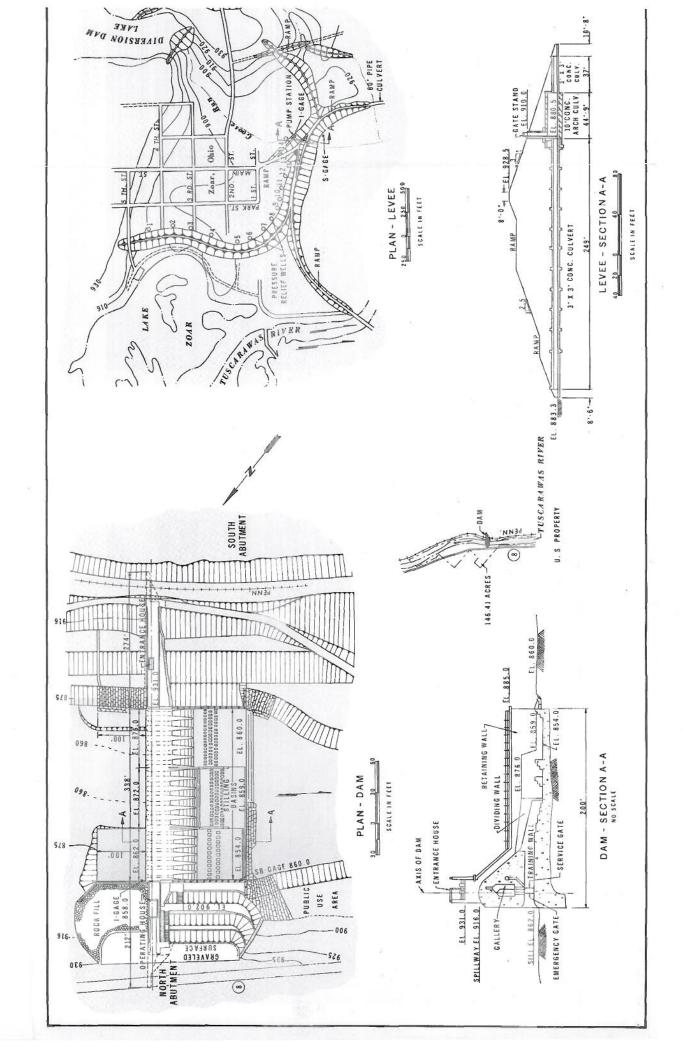
Location: F.O.P. Lodge

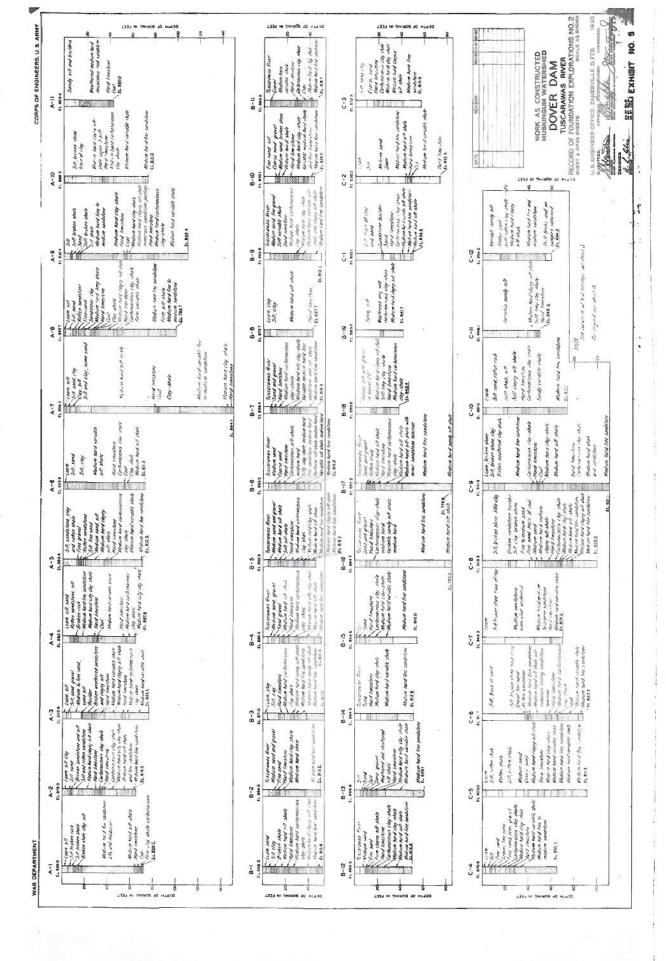
<u>General Comment/Recommendation</u>: The FOP lodge relies on the well to provide water for washing and toileting. Since this water is not being tested as to potability, the faucet in the downstairs toilet area (and any other sources – the kitchen sink was noted to already be labeled) should be immediately labeled "WATER NOT FIT TO DRINK."

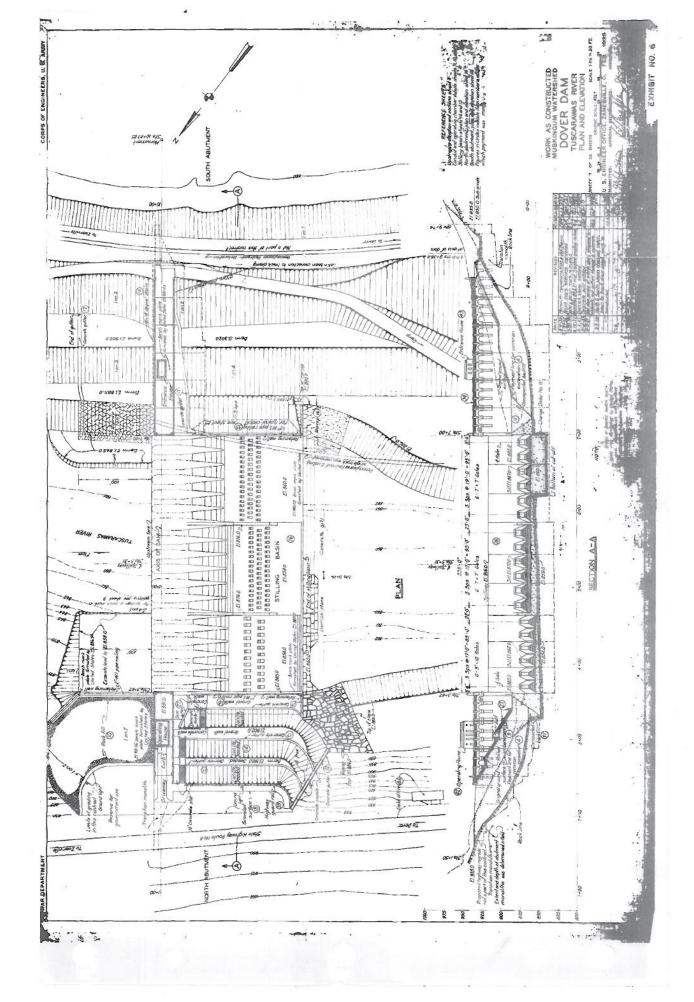
Location: Project Office

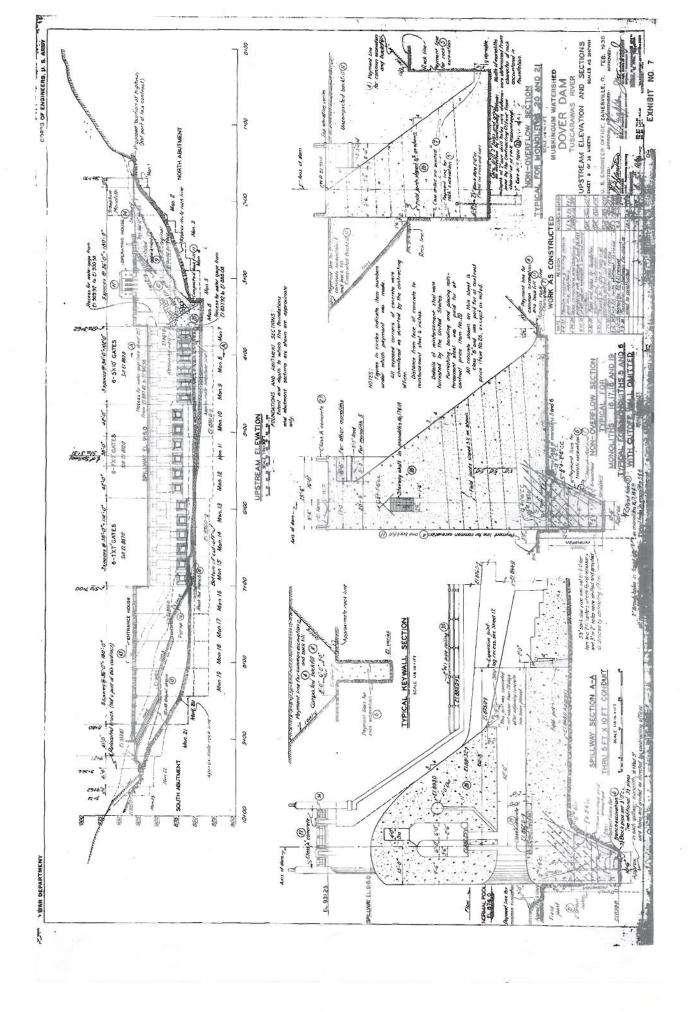
General Comment/Recommendation: The well supplying water to the Dover Dam project office has a high lead content. Due to this, project personnel have marked all hose bibs, faucets, and other sources of water as "WATER NOT FIT TO DRINK." The project had been purchasing bottled water for human consumption until the summer of 2003, when Contracting Division precluded the purchases in the absence of specific authorization. Kevin Osborne has a letter signed by the Chief, OR, on 12 August 2003, authorizing Dover Dam to continue purchasing bottled water for human consumption in the future. Recommend that the project place a copy of the implementing memorandum in their MARKS 200 Environmental Compliance Files, and to keep all "WATER NOT FIT TO DRINK" labels on all sources of water supplied by the well. Note: The purchase of bottled water and the labeling of faucets and hose bibs documents that Dover Dam continues to utilize Good Management Practice.

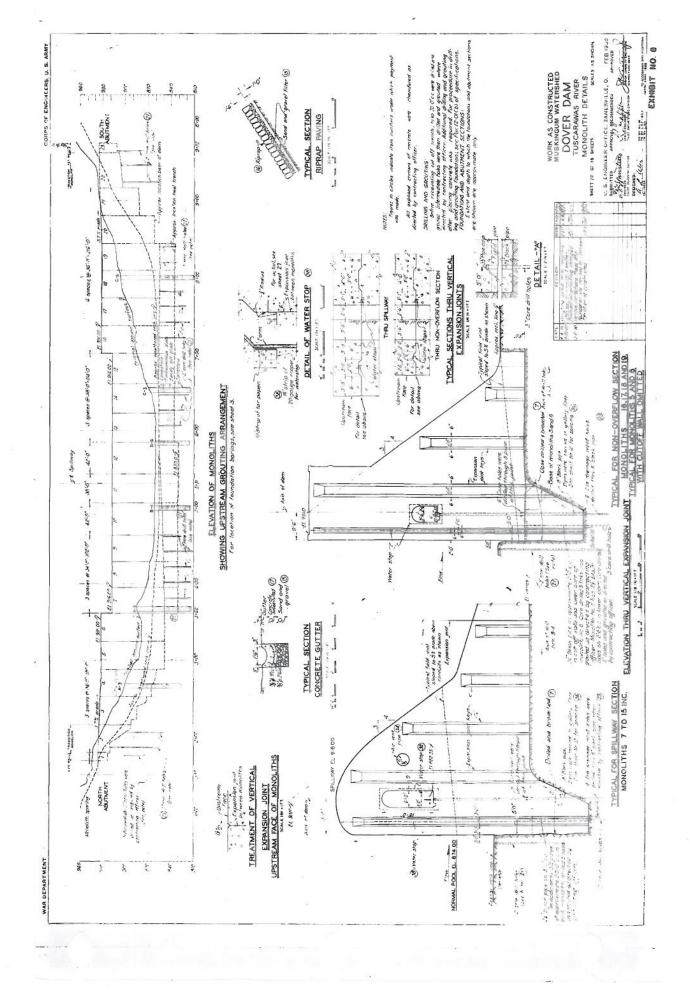
As-Built Drawings of Dover Dam

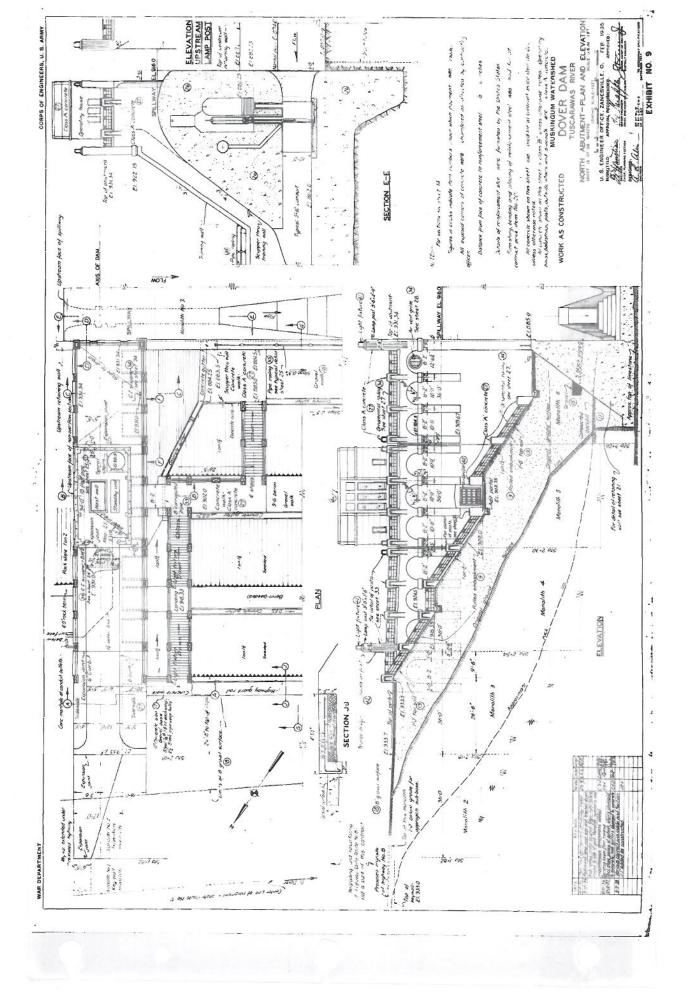


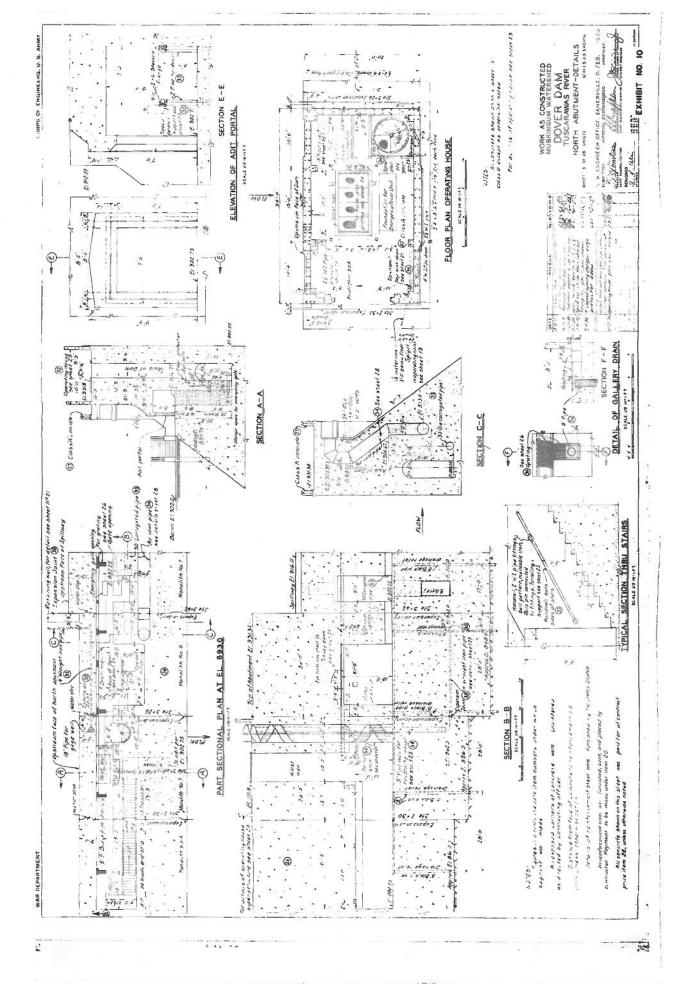


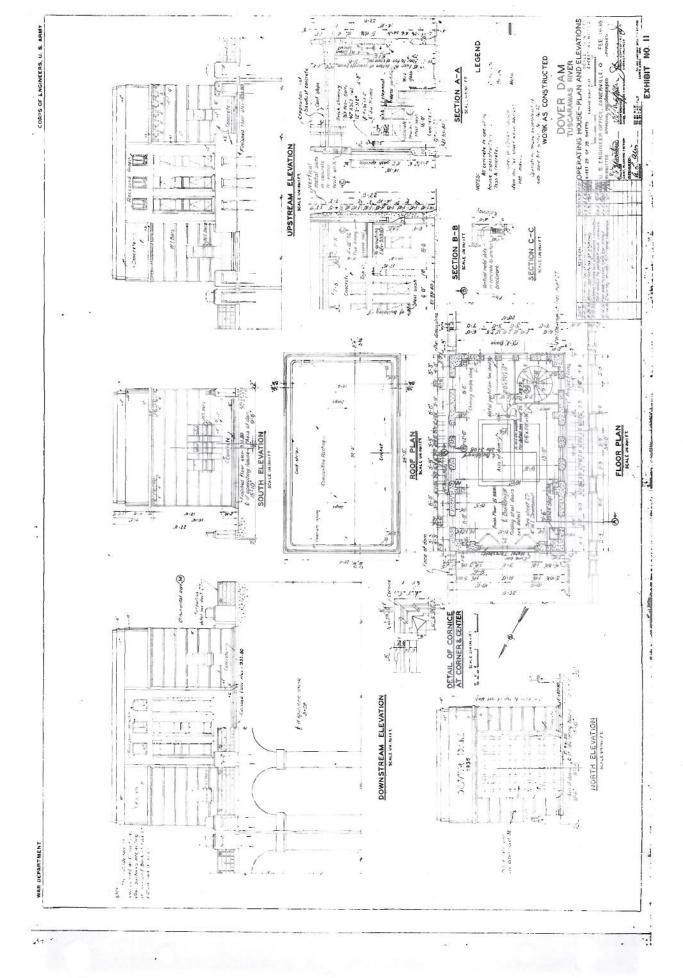


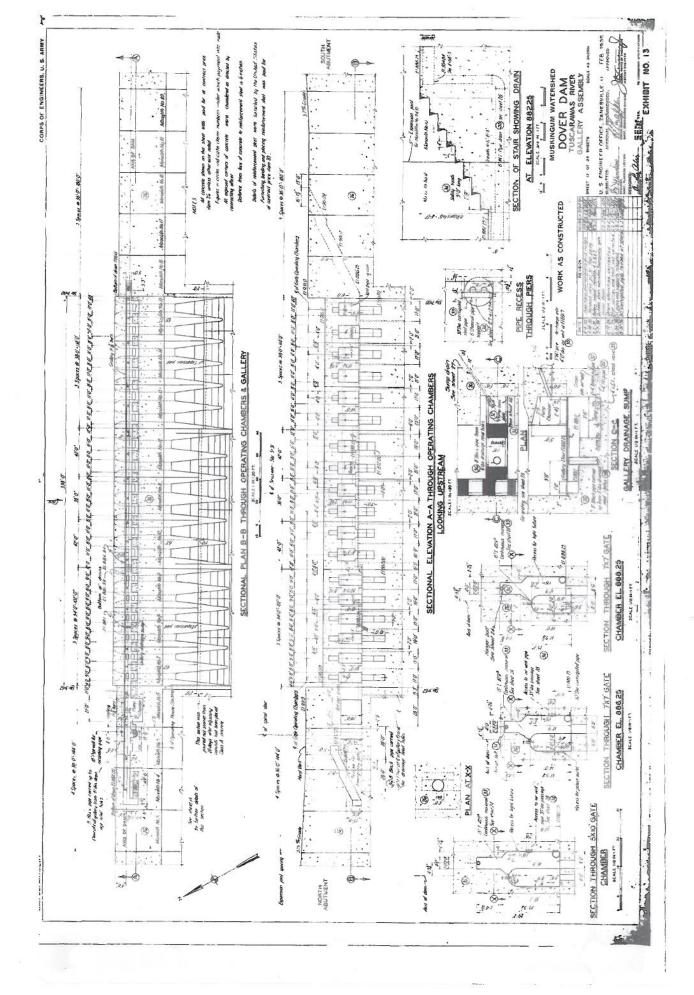


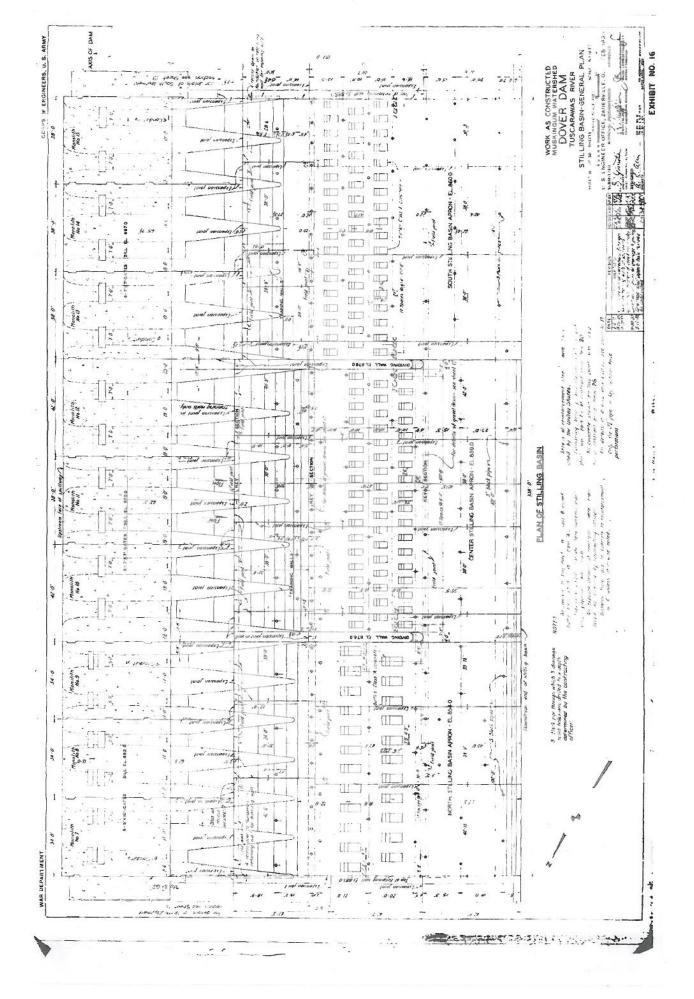


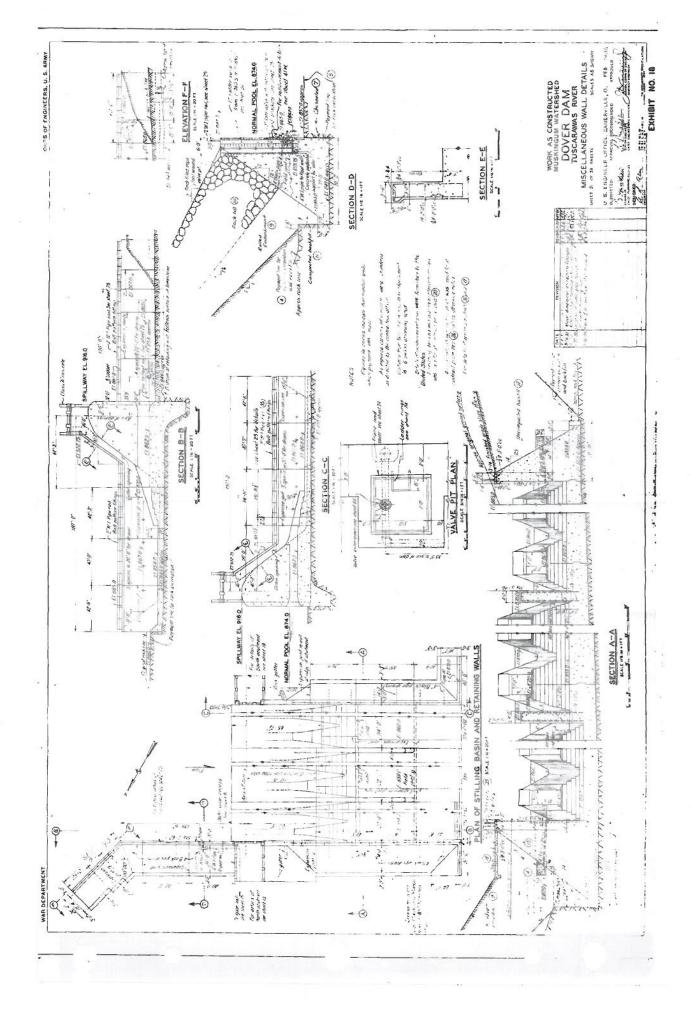












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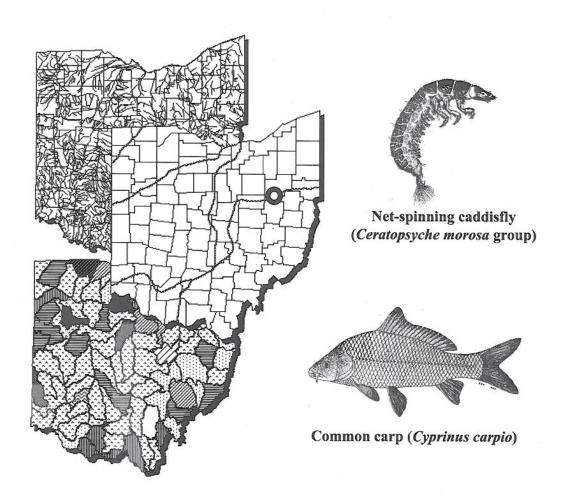
Ohio EPA Biological and Sediment Study Of the Tuscarawas River February 29, 1006



Biological and Sediment Study of the Tuscarawas River

Tuscarawas and Stark Counties, Ohio

Ashland Oil Spill, June 1995



Biological and Sediment Quality Study of the Tuscarawas River

Ashland Oil Spill 1995

Stark and Tuscarawas Counties, Ohio

February 29, 1996

OEPA Technical Report MAS/1996-2-1

prepared for

State of Ohio Environmental Protection Agency Division of Emergency and Remedial Response

prepared by

State of Ohio Environmental Protection Agency
Division of Surface Water
Ecological Assessment Unit
1685 Westbelt Dr.
Columbus, Ohio 43228

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NOTICE TO USERS

Ohio EPA incorporated biological criteria into the Ohio Water Quality Standards (WQS; Ohio Administrative Code 3745-1) regulations in February 1990 (effective May 1990). These criteria consist of numeric values for the Index of Biotic Integrity (IBI) and Modified Index of Well-Being (MIwb), both of which are based on fish assemblage data, and the Invertebrate Community Index (ICI), which is based on macroinvertebrate assemblage data. Criteria for each index are specified for each of Ohio's five ecoregions (as described by Omernik 1987), and are further organized by organism group, index, site type, and aquatic life use designation. These criteria, along with the existing chemical and whole effluent toxicity evaluation methods and criteria, figure prominently in the monitoring and assessment of Ohio's surface water resources.

The following documents support the use of biological criteria by outlining the rationale for using biological information, the methods by which the biocriteria were derived and calculated, the field methods by which sampling must be conducted, and the process for evaluating results:

- Ohio Environmental Protection Agency. 1987a. Biological criteria for the protection of aquatic life: Volume I. The role of biological data in water quality assessment. Div. Water Qual. Monit. & Assess., Surface Water Section, Columbus, Ohio.
- Ohio Environmental Protection Agency. 1987b. Biological criteria for the protection of aquatic life: Volume II. Users manual for biological field assessment of Ohio surface waters. Div. Water Qual. Monit. & Assess., Surface Water Section, Columbus, Ohio.
- Ohio Environmental Protection Agency. 1989b. Addendum to Biological criteria for the protection of aquatic life: Volume II. Users manual for biological field assessment of Ohio surface waters. Div. Water Qual. Plan. & Assess., Ecological Assessment Section, Columbus, Ohio.
- Ohio Environmental Protection Agency. 1989c. Biological criteria for the protection of aquatic life: Volume III. Standardized biological field sampling and laboratory methods for assessing fish and macroinvertebrate communities. Div. Water Quality Plan. & Assess., Ecol. Assess. Sect., Columbus, Ohio.
- Ohio Environmental Protection Agency. 1990. The use of biological criteria in the Ohio EPA surface water monitoring and assessment program. Div. Water Qual. Plan. & Assess., Ecol. Assess. Sect., Columbus, Ohio.
- Rankin, E.T. 1989. The qualitative habitat evaluation index (QHEI): rationale,methods, and application. Div. Water Qual. Plan. & Assess., Ecol. Assess. Sect., Columbus, Ohio.

Since the publication of the preceding guidance documents new publications by Ohio EPA have become available. The following publications should also be consulted as they represent the latest information and analyses used by Ohio EPA to implement the biological criteria.

- DeShon, J.D. 1995. Development and application of the invertebrate community index (ICI), pp. 217-243. in W.S. Davis and T. Simon (eds.). Biological Assessment and Criteria: Tools for Risk-based Planning and Decision Making. Lewis Publishers, Boca Raton, FL.
- Rankin, E. T. 1995. The use of habitat assessments in water resource management programs, pp. 181-208. in W. Davis and T. Simon (eds.). Biological Assessment and Criteria: Tools for Water Resource Planning and Decision Making. Lewis Publishers, Boca Raton, FL.
- Yoder, C.O. and E.T. Rankin. 1995. Biological criteria program development and implementation in Ohio, pp. 109-144. in W. Davis and T. Simon (eds.). Biological Assessment and Criteria: Tools for Water Resource Planning and Decision Making. Lewis Publishers, Boca Raton, FL.
- Yoder, C.O. and E.T. Rankin. 1995. Biological response signatures and the area of degradation value: new tools for interpreting multimetric data, pp. 263-286. in W. Davis and T. Simon (eds.). Biological Assessment and Criteria: Tools for Water Resource Planning and Decision Making. Lewis Publishers, Boca Raton, FL.
- Yoder, C.O. 1995. Policy issues and management applications for biological criteria, pp. 327-344. in W. Davis and T. Simon (eds.). Biological Assessment and Criteria: Tools for Water Resource Planning and Decision Making. Lewis Publishers, Boca Raton, FL.
- Yoder, C.O. and E.T. Rankin. 1995. The role of biological criteria in water quality monitoring, assessment, and regulation. Environmental Regulation in Ohio: How to Cope With the Regulatory Jungle. Inst. of Business Law, Santa Monica, CA. 54 pp.

These documents and this report can be obtained by writing to:

Ohio EPA, Division of Surface Water Monitoring and Assessment Section 1685 Westbelt Drive Columbus, Ohio 43228-3809 (614) 728-3377

FOREWORD

What is a Biological and Water Quality Survey?

A biological and water quality survey, or "biosurvey", is an interdisciplinary monitoring effort coordinated on a waterbody specific or watershed scale. This effort may involve a relatively simple setting focusing on one or two small streams, one or two principal stressors, and a handful of sampling sites or a much more complex effort including entire drainage basins, multiple and overlapping stressors, and tens of sites. Each year Ohio EPA conducts biosurveys in 10-15 different study areas with an aggregate total of 250-300 sampling sites.

Ohio EPA employs biological, chemical, and physical monitoring and assessment techniques in biosurveys in order to meet three major objectives: 1) determine the extent to which use designations assigned in the Ohio Water Quality Standards (WQS) are either attained or not attained; 2) determine if use designations assigned to a given water body are appropriate and attainable; and 3) determine if any changes in key ambient biological, chemical, or physical indicators have taken place over time, particularly before and after the implementation of point source pollution controls or best management practices. The data gathered by a biosurvey is processed, evaluated, and synthesized in a biological and water quality report. Each biological and water quality study contains a summary of major findings and recommendations for revisions to WQS, future monitoring needs, or other actions which may be needed to resolve existing impairment of designated uses. While the principal focus of a biosurvey is on the status of aquatic life uses, the status of other uses such as recreation and water supply, as well as human health concerns, are also addressed.

The findings and conclusions of a biological and water quality study may factor into regulatory actions taken by Ohio EPA (e.g., NPDES permits, Director's Orders, the Ohio Water Quality Standards [OAC 3745-1]), and are eventually incorporated into Water Quality Permit Support Documents (WQPSDs), State Water Quality Management Plans, the Ohio Nonpoint Source Assessment, and the Ohio Water Resource Inventory (305[b] report).

Hierarchy of Indicators

A carefully conceived ambient monitoring approach, using cost-effective indicators comprised of ecological, chemical, and toxicological measures, can ensure that all relevant pollution sources are judged objectively on the basis of environmental results. Ohio EPA relies on a tiered approach in attempting to link the results of administrative activities with true environmental measures. This integrated approach is outlined in Figure I and includes a hierarchical continuum from administrative to true environmental indicators. The six "levels" of indicators include: 1) actions taken by regulatory agencies (permitting, enforcement, grants); 2) responses by the regulated community (treatment works, pollution prevention); 3) changes in discharged quantities (pollutant loadings); 4) changes in ambient conditions (water quality, habitat); 5) changes in

uptake and/or assimilation (tissue contamination, biomarkers, wasteload allocation); and, 6) changes in health, ecology, or other effects (ecological condition, pathogens). In this process the results of administrative activities (levels 1 and 2) can be linked to efforts to improve water quality (levels 3, 4, and 5) which should translate into the environmental "results" (level 6). Thus, the aggregate effect of billions of dollars spent on water pollution control since the early 1970s can now be determined with quantifiable measures of environmental condition.

Superimposed on this hierarchy is the concept of stressor, exposure, and response indicators. Stressor indicators generally include activities which have the potential to degrade the aquatic environment such as pollutant discharges (permitted and unpermitted), land use effects, and habitat modifications. Exposure indicators are those which measure the effects of stressors and can include whole effluent toxicity tests, tissue residues, and biomarkers, each of which provides

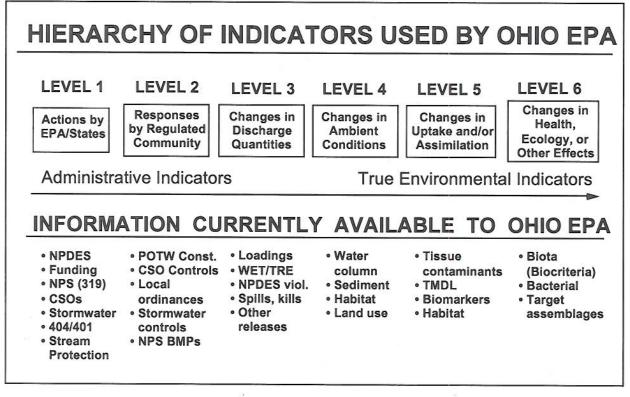


Figure I. Hierarchy of administrative and environmental indicators used by Ohio EPA for monitoring, assessment, reporting, and evaluating program effectiveness. This is patterned after a model developed by the U.S. EPA, Office of Water.

evidence of biological exposure to a stressor or bioaccumulative agent. *Response* indicators are generally composite measures of the cumulative effects of stress and exposure and include the

the more direct measures of community and population response that are represented here by the biological indices which comprise Ohio's biological criteria. Other response indicators could include target assemblages, *i.e.*, rare, threatened, endangered, special status, and declining species or bacterial levels which serve as surrogates for the recreational uses. These indicators represent the essential technical elements for watershed-based management approaches. The key, however, is to use the different indicators within the roles which are most appropriate for each.

Describing the causes and sources associated with observed impairments revealed by the biological criteria and linking this with pollution sources involves an interpretation of multiple lines of evidence including water chemistry data, sediment data, habitat data, effluent data, biomonitoring results, land use data, and biological response signatures within the biological data itself. Thus the assignment of principal causes and sources of impairment represents the association of impairments (defined by response indicators) with stressor and exposure indicators. The principal reporting venue for this process on a watershed or subbasin scale is a biological and water quality report. These reports then provide the foundation for aggregated assessments such as the Ohio Water Resource Inventory (305[b] report), the Ohio Nonpoint Source Assessment, and other technical bulletins.

Ohio Water Quality Standards: Designated Aquatic Life Uses

The Ohio Water Quality Standards (WQS; Ohio Administrative Code 3745-1) consist of designated uses and chemical, physical, and biological criteria designed to represent measurable properties of the environment that are consistent with the goals specified by each use designation. Use designations consist of two broad groups, aquatic life and non-aquatic life uses. In applications of the Ohio WQS to the management of water resource issues in Ohio's rivers and streams, the aquatic life use criteria frequently result in the most stringent protection and restoration requirements, hence their emphasis in biological and water quality reports. Also, an emphasis on protecting for aquatic life generally results in water quality suitable for all uses. The five different aquatic life uses currently defined in the Ohio WQS are described as follows:

- 1) Warmwater Habitat (WWH) this use designation defines the "typical" warmwater assemblage of aquatic organisms for Ohio rivers and streams; this use represents the principal restoration target for the majority of water resource management efforts in Ohio.
- 2) Exceptional Warmwater Habitat (EWH) this use designation is reserved for waters which support "unusual and exceptional" assemblages of aquatic organisms which are characterized by a high diversity of species, particularly those which are highly intolerant and/or rare, threatened, endangered, or special status (i.e., declining species); this designation represents a protection goal for water resource management efforts dealing with Ohio's best water resources.

- 3) Coldwater Habitat (CWH) this use is intended for waters which support assemblages of cold water organisms and/or those which are stocked with salmonids with the intent of providing a put-and-take fishery on a year round basis which is further sanctioned by the Ohio DNR, Division of Wildlife; this use should not be confused with the Seasonal Salmonid Habitat (SSH) use which applies to the Lake Erie tributaries which support periodic "runs" of salmonids during the spring, summer, and/or fall.
- 4) Modified Warmwater Habitat (MWH) this use applies to streams and rivers which have been subjected to extensive, maintained, and essentially permanent hydromodifications such that the biocriteria for the WWH use are not attainable and where the activities have been sanctioned and permitted by state or federal law; the representative aquatic assemblages are generally composed of species which are tolerant to low dissolved oxygen, silt, nutrient enrichment, and poor quality habitat.
- 5) Limited Resource Water (LRW) this use applies to small streams (usually <3 mi.² drainage area) and other water courses which have been irretrievably altered to the extent that no appreciable assemblage of aquatic life can be supported; such waterways generally include small streams in extensively urbanized areas, those which lie in watersheds with extensive drainage modifications, those which completely lack water on a recurring annual basis (i.e., true ephemeral streams), or other irretrievably altered waterways.

Chemical, physical, and/or biological criteria are generally assigned to each use designation in accordance with the broad goals defined by each. As such the system of use designations employed in the Ohio WQS constitutes a "tiered" approach in that varying and graduated levels of protection are provided by each. This hierarchy is especially apparent for parameters such as dissolved oxygen, ammonia-nitrogen, temperature, and the biological criteria. For other parameters such as heavy metals, the technology to construct an equally graduated set of criteria has been lacking, thus the same water quality criteria may apply to two or three different use designations.

Ohio Water Quality Standards: Non-Aquatic Life Uses

In addition to assessing the appropriateness and status of aquatic life uses, each biological and water quality survey also addresses non-aquatic life uses such as recreation, water supply, and human health concerns as appropriate. The recreation uses most applicable to rivers and streams are the Primary Contact Recreation (PCR) and Secondary Contact Recreation (SCR) uses. The criterion for designating the PCR use is simply having a water depth of at least one meter over an area of at least 100 square feet or where canoeing is a feasible activity. If a water body is too small and shallow to meet either criterion the SCR use applies. The attainment status of PCR and SCR is determined using bacterial indicators (e.g., fecal coliforms, E. coli) and the criteria for each are specified in the Ohio WOS.

Water supply uses include Public Water Supply (PWS), Agricultural Water Supply (AWS), and Industrial Water Supply (IWS). Public Water Supplies are simply defined as segments within 500 yards of a potable water supply or food processing industry intake. The Agricultural Water Supply (AWS) and Industrial Water Supply (IWS) use designations generally apply to all waters unless it can be clearly shown that they are not applicable. An example of this would be an urban area where livestock watering or pasturing does not take place, thus the AWS use would not apply. Chemical criteria are specified in the Ohio WQS for each use and attainment status is based primarily on chemical-specific indicators. Human health concerns are additionally addressed with fish tissue data, but any consumption advisories are issued by the Ohio Department of Health and detailed in other documents.

ACKNOWLEDGEMENTS

The following Ohio EPA staff are acknowledged for their significant contribution to this report.

Coordinator - David Altfater
Data Management - Dennis Mishne and Ed Rankin
Fish Data Analysis, Sediment - David Altfater
Macroinvertebrate Data Analysis - Bernie Counts
Reviewers - Chris Yoder, Jeff DeShon, and Marc Smith

Support during field collections was provided by Kelly Cappuzi, Jeff Wander, Eric Schultz, Wendy Vorwerk, Mike Pettegrew, Bret Henninger, and Erica Burnett.

Biological and Sediment Quality Study of the Tuscarawas River (Stark and Tuscarawas Counties, Ohio)

Ohio Environmental Protection Agency
Division of Surface Water
Monitoring and Assessment Section
Ecological Assessment Unit
1685 Westbelt Drive
Columbus, Ohio 43228

INTRODUCTION

The Tuscarawas River study area included the mainstem river from Riverland Road (RM 81.4) to near Dover dam (RM 64.1).

Specific objectives of this evaluation were to:

- 1) measure and determine biological condition and sediment quality in the Tuscarawas River in the vicinity of the Ashland oil spill,
- 2) determine the potential accumulation of contaminants in river sediments in the vicinity of the Ashland oil spill,
- 3) determine the attainment status of the current WWH aquatic life use designation for the Tuscarawas River within the study area, and
- 4) follow-up on conditions documented in the 1989 Ohio EPA survey.

A pipeline construction company laying a new high pressure petroleum pipeline in close proximity to an active high pressure crude oil transmission pipeline operated by Ashland Pipeline sheared off a valve within 50 feet of the Tuscarawas River on June 7, 1995. Over 300 barrels of crude oil discharged to the Tuscarawas River approximately seven miles upstream from Bolivar. Containment booms were deployed at several locations downstream with limited success; eventually, the crude oil was contained behind Dover Dam, approximately 16 miles downstream from the spill site. The dam and containment boom stopped the majority of the crude oil with only a sheen passing through the dam.

The Tuscarawas River study area is located in the Erie-Ontario Lake Plain (EOLP) and Western Allegheny Plateau (WAP) ecoregions and is currently assigned the Warmwater Habitat (WWH) aquatic life use.

SUMMARY / CONCLUSIONS

From June to August, 1995 staff from the Ohio EPA Divisions of Surface Water and Emergency and Remedial Response conducted biological community and sediment sampling on the Tuscarawas River in the vicinity of the Ashland oil spill. The results of these sampling events are summarized below.

- Non-attainment of the Warmwater Habitat (WWH) aquatic life use designation occurred at five of the seven biological sampling locations, including the site located upstream from the oil spill (Table 2). Partial attainment of the WWH use was observed at the remaining two sampling locations (RMs 71.6 68.7). Biological results from 1995 for the Tuscarawas River study area indicate that 5.7 miles of river were in partial attainment of the WWH use and 11.6 miles of river were not meeting the WWH use designation. The partial and non-attainment status of the biological sampling locations was due primarily to the poor to fair performance of the fish communities.
- The biological results suggest that the fish communities were impaired by residual toxic stresses originating upstream from the oil spill. Macroinvertebrate communities were fully achieving the WWH biocriterion at each sampling location, however the lowest ICI score was observed at RM 78.2 (Dolphin St.). Overall, any biological impairment associated with the oil spill was minor.
- Sediment sampling results revealed slightly elevated concentrations of polycyclic aromatic hydrocarbons (PAHs) at all Tuscarawas River sites. Of particular note was the elevated concentrations of hexachlorobenzene at all sampling locations (excluding RM 79.8 which was influenced by high method detection levels). The levels of hexachlorobenzene were above the Severe Effect Level guideline, a level indicating possible pronounced disturbance of the sediment-dwelling community (Persaud *et al.* 1993). This is due to the effects of upstream sources. Total petroleum hydrocarbons (TPH) were measured in the sediment as an indicator of crude oil contamination. TPH was measured in the Tuscarawas River sediments in the immediate spill area at ten times the upstream concentration. The other downstream sampling locations had TPH levels comparable to the upstream background site, indicating the effect of the spill was localized.
- The physical condition of fish was monitored at each sampling site by recording the incidence of gross DELT (deformities, fin erosions, lesions/ulcers and tumors) external anomalies. An elevated percentage of DELT anomalies was recorded at each sampling location, with results ranging between 8.4% and 26.3%. A majority of the DELT anomalies were deformities on adult common carp, a condition not associated with the spill. Some fish species (rock bass, smallmouth bass, yellow bullhead) collected downstream from the oil spill area had a black material coating the outer edge of the pelvic, anal, caudal and pectoral fins (Plate 1). The black material was associated with the oil spill.

Table 1. Sampling locations (sediment - S, macroinvertebrate - M, fish - F) in the Tuscarawas River, 1995.

Stream/ River Mile	Type of Sampling	Latitude	Longitude	Landmark	County	USGS 7.5 min. Quad. Map
Tuscarawas	River					
81.45	S	40°41'40"	81°30'13"	Riverland Ave.	Stark	Navarre, OH
81.4	M,F	40°41'40"	81°30'13"	Riverland Ave.	Stark	Navarre, OH
79.97	S	40°40'45"	81°29'14"	Pipeline crossing area	Stark	Bolivar, OH
79.8	M,F	40°40'37"	81°29'11"	Pipeline crossing area	Stark	Bolivar, OH
78.2	M,F	40°39'18"	81°29'07"	Dolphin St.	Stark	Bolivar, OH
78.06	S	40°39'11"	81°29'12"	Dolphin St.	Stark	Bolivar, OH
73.64	M,S	40°39'47"	81°26'21"	I-77	Stark/ Tuscarawas	Bolivar, OH
73.4	F	40°39'36"	81°26'06"	I-77	Stark/ Tuscarawas	Bolivar, OH
71.62	S	40°38'29"	81°27'01"	State Route 212	Tuscarawas	Bolivar, OH
71.6	M	40°38'28"	81°27'02"	State Route 212	Tuscarawas	Bolivar, OH
70.8	F	40°38'01"	81°27'09"	Dst. golf course,Bolivar	Tuscarawas	Bolivar, OH
68.72	S	40°36'33"	81°25'43"	Ust. Co. Rd. 82, Zoar	Tuscarawas	Dover, OH
68.7	M,F	40°36'31"	81°25'41"	Co. Rd. 82, Zoar	Tuscarawas	Dover, OH
64.9	M	40°34'11"	81°24'02"	Ust. Dover dam	Tuscarawas	Dover, OH
64.81	S	40°34'08"	81°24'04"	Ust. Dover dam	Tuscarawas	Dover, OH
64.1	F	40°33'40"	81°24'27"	Ust. Dover dam	Tuscarawas	Dover, OH

Table 2. Aquatic life use attainment status for the Tuscarawas River based upon sampling conducted between June and August, 1995. The results for the 1989 survey are also included. Attainment status is based on WWH biocriteria for the Erie-Ontario Lake Plain and Western Allegheny Plateau ecoregions of Ohio (OAC Chapter 3745-1-07, Table 7-17).

RIVER MILE Fish/ Invert.	IBI	BI MIwb IC		Atta CI ² QHEI St		Comment
Tuscarawas Riv	er 1995					8
81.4 / 81.4 En	rie-Ontar 26*	io Lake Pl 5.5*	ain ecoregi 40	ion - WWI 73.0	H use Designation NON	on (Existing) Upstream reference
79.8 / 79.8	23*	<u>5.6</u> *	46	73.5	NON	Immediately dst. oil spill
78.2 / 78.2	<u>25</u> *	<u>5.6</u> *	34	74.0	NON	Dolphin St.
73.4 / 73.6	<u>20</u> *	<u>4.7</u> *	42	63.0	NON	I-77
70.8 / 71.6	estern Al 30*	legheny P 6.6*	lateau ecor 42	egion - W 77.5	WH use Designa PARTIAL	ttion (Existing) Dst. SR 212, Bolivar
68.7 / 68.7	33*	6.8*	42	80.5	PARTIAL	County Rd.82, Zoar
64.1 / 64.9	<u>18</u> *	4.6* V	ery Good	70.5	NON	Ust. Dover dam
Tuscarawas Riv				004/2 00 YO		ne name of the
81.6 / 81.4	2rie-Onta 17*	rio Lake F <u>4.3</u> *	lain ecores 34	gion - WW 45.0	H use Designat NON	ion (Existing) Riverland Rd.
78.1 / 78.2	<u>20</u> *	<u>5.0</u> *	40	75.0	NON	Dolphin St.
73.4 / 73.6	<u>25</u> *	7.5*	42	51.0	NON	I-77
70.8 / -	estern Al 23*	legheny Pi 4.9*	lateau ecor -	egion - Wi 68.0	WH use Designa (NON)	tion (Existing) Dst. SR 212, Bolivar
68.7 / 68.8	26*	<u>6.0</u> *	42	90.0	NON	County Rd. 82, Zoar
- / 64.6	-	-	42	-	(FULL)	Ust. Dover dam
2	Ecor	egion Bio	criteria : H	Erie Ontari estern All	o Lake Plain (E egheny Plateau	OLP)/ (WAP)
		INDEX IBI - Boat MIwb - Bo ICI	oat 8.	VWH 0/40 7/8.6 4/36	48/48 9.6/9.6 5.8	WHc 1/24 8/5.8 1/22

ns Nonsignificant departure from EWH ecoregional biocriterion (≤ 4 IBI or ICI units or ≤ 0.5 MIwb units).

* Significant departure from ecoregion biocriterion (>4 IBI units or ICI units or ≤ 0.5 MIwb units); poor and very poor results are underlined.

Narrative evaluation based on qualitative benthic invertebrate sample.

Attainment status based on one organism group is parenthetically expressed.
Modified Warmwater Habitat for channel modified areas.

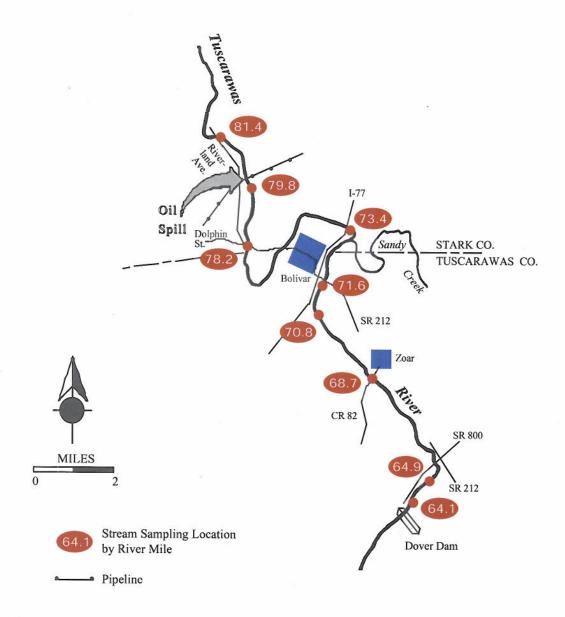


Figure 1. Map of the Tuscarawas River study area showing principal streams, landmarks, the oil spill location and Ohio EPA biological sampling locations, 1995.

METHODS

All chemical, physical, and biological field, laboratory, data processing, and data analysis methodologies and procedures adhere to those specified in the Manual of Ohio EPA Surveillance Methods and Quality Assurance Practices (Ohio Environmental Protection Agency 1989a) and Biological Criteria for the Protection of Aquatic Life, Volumes I-III (Ohio Environmental Protection Agency 1987a, 1987b, 1989b, 1989c), and The Qualitative Habitat Evaluation Index (QHEI): Rationale, Methods, and Application (Rankin 1989) for aquatic habitat assessment. Fish communities, macroinvertebrate communities, and sediment were sampled during the summer of 1995 at seven locations on the Tuscarawas River from river miles (RM) 81.4 to 64.1 (Table 1, Figure 1). Sampling was conducted to assess fish and macroinvertebrate communities, and sediment in the vicinity of the Ashland oil spill.

Determining Use Attainment Status

The attainment status of aquatic life uses (*i.e.*, full, partial, and non) is determined by using the biological criteria codified in the Ohio Water Quality Standards (WQS; Ohio Administrative Code [OAC] 3745-1-07, Table 7-17). The biological community performance measures which are used include the Index of Biotic Integrity (IBI) and Modified Index of Well-Being (MIwb), based on fish community characteristics, and the Invertebrate Community Index (ICI) which is based on macroinvertebrate community characteristics. The IBI and ICI are multimetric indices patterned after an original IBI described by Karr (1981) and Fausch *et al.* (1984). The ICI was developed by Ohio EPA (1987b) and further described by DeShon (1995). The MIwb is a measure of fish community abundance and diversity using numbers and weight information and is a modification of the original Index of Well-Being originally applied to fish community information from the of the original Index of Well-Being originally applied to fish community information from the Wabash River (Gammon 1976; Gammon et al. 1981).

Performance expectations for the principal aquatic life uses in the Ohio WOS (Warmwater Habitat [WWH], Exceptional Warmwater Habitat [EWH], and Modified Warmwater Habitat [MWH]) were developed using the regional reference site approach (Hughes et al. 1986; Omernik 1987). This fits the practical definition of biological integrity as the biological performance of the natural habitats within a region (Karr and Dudley 1981). Attainment of the aquatic life use is full if all three indices (or those available) meet the applicable biocriteria, partial if at least one of the indices does not attain and performance is at least fair, and non-attainment if all indices fail to attain or any index indicates poor or very poor performance. Partial and non-attainment indicate that the receiving water is impaired and does not meet the designated use criteria specified by the Ohio WQS.

Habitat Assessment

Physical habitat was evaluated using the Qualitative Habitat Evaluation Index (QHEI) developed by the Ohio EPA for streams and rivers in Ohio (Rankin 1989, 1995). Various attributes of the habitat are scored based on the overall importance of each to the maintenance of viable, diverse, and functional aquatic faunas. The type(s) and quality of substrates, amount and quality of instream cover, channel morphology, extent and quality of riparian vegetation, pool, run, and riffle development and quality, and gradient are some of the metrics used to determine the QHEI score which generally ranges from 20 to 100. The QHEI is used to evaluate the characteristics of a stream segment, as opposed to the characteristics of a single sampling site. As such, individual sites may have poorer physical habitat due to a localized disturbance yet still support aquatic communities closely resembling those sampled at adjacent sites with better habitat, provided water quality conditions are similar. QHEI scores from hundreds of segments around the state have indicated that values greater than 60 are generally conducive to the existence of warmwater faunas. Scores greater than 75 frequently typify habitat conditions which have the ability to support exceptional warmwater faunas.

Sediment Assessment

Fine grained sediment samples were collected in the upper six inches of bottom material at each location using decontaminated stainless steel scoop samplers (decontamination followed the procedures outlined in FSOP 10.01, DERR Sampling Guidance, Vol. III, Ohio EPA 1992). Collected sediment was placed into decontaminated clear glass jars with teflon lined lids, placed on ice (to maintain 4°C) and shipped to an Ohio EPA contract lab. Sediment data is reported on a dry weight basis. Sediment evaluations were conducted using guidelines established by the Ontario Ministry of the Environment (Persaud *et al.* 1993), reference conditions and published literature.

Macroinvertebrate Community Assessment

Macroinvertebrates were sampled quantitatively for a six-week period from June 19 to August 2, 1995 using multiple-plate, artificial substrate samplers (modified Hester/Dendy) in conjunction with a qualitative assessment of the available natural substrates. During the present study, macroinvertebrates collected from the natural substrates were also evaluated using an assessment tool currently in the testing and refinement phase. This method relies on tolerance values derived for each taxon, based upon the abundance data for that taxon from artificial substrate (quantitative) samples collected throughout Ohio. To determine the tolerance value of a given taxon, ICI scores at all locations where the taxon has been collected are weighted by its abundance on the artificial substrates. The mean of the weighted ICI scores for the taxon results in a value which represents its relative level of tolerance on the ICI's 0 to 60 scale. For the qualitative collections in the Tuscarawas River study area, the median tolerance value of all organisms from a site resulted in a score termed the Qualitative Community Tolerance Value (QCTV). The QCTV shows potential as a method to supplement existing assessment methods using the natural substrate collections. Use of the QCTV in evaluating sites in the Tuscarawas River study area was restricted to relative comparisons between sites and was not unilaterally used to interpret quality of the sites or aquatic life use attainment status.

Fish Community Assessment

Fish were sampled using the boat method pulsed DC electrofishing gear, used at a frequency of two samples at each site. Fish collections were made at each site from June to August using pulsed DC electrofishing gear, with a sampling distance of 500 meters.

Causal Associations

Using the results, conclusions, and recommendations of this report requires an understanding of the methodology used to determine the use attainment status and assigning probable causes and sources of impairment. The identification of impairment in rivers and streams is straightforward—the numerical biological criteria are the principal arbiter of aquatic life use attainment and impairment (partial and non-attainment). The rationale for using the biological criteria in the role of principal arbiter within a weight of evidence framework has been extensively discussed elsewhere (Karr et al. 1986; Karr 1991; Ohio EPA 1987a,b; Yoder 1989; Miner and Borton 1991; Yoder 1991; Yoder 1995). Describing the causes and sources associated with observed impairments relies on an interpretation of multiple lines of evidence including water chemistry data, sediment data, habitat data, effluent data, biomonitoring results, land use data, and the biological response signatures (Yoder and Rankin 1995) within the biological data itself. Thus the assignment of principal causes and sources of impairment in this report do not represent a true "cause and effect" analysis, but rather represent the association of impairments (based on response indicators) with stressor and exposure indicators whose links with the biosurvey data are based on previous research or experience with analogous situations and impacts. The reliability of the identification of probable causes and sources is increased where many such prior associations have been identified. The process is similar to making a medical diagnosis in which a doctor relies on multiple lines of evidence concerning patient health. Such diagnoses are based on previous research which experimentally or statistically linked symptoms and test results to specific diseases or pathologies. Thus a doctor relies on previous experience in interpreting

symptoms (*i.e.*, multiple lines from test results) to establish a diagnosis, potential causes and/or sources of the malady, a prognosis, and a strategy for alleviating the symptoms of the disease or condition. As in medical science, where the ultimate arbiter of success is the eventual recovery and the well-being of the patient, the ultimate measure of success in water resource management is restoration of lost or damaged ecosystem attributes including aquatic community structure and function. While there have been criticisms of misapplying the metaphor of ecosystem "health" compared to human patient "health" (Suter 1993) here we are referring to the process for identifying biological integrity and causes/sources associated with observed impairment, not whether human health and ecosystem health are analogous concepts.

RESULTS AND DISCUSSION

Sediment Chemistry

Sediment samples were collected at seven locations in the Tuscarawas River by the Ohio EPA during June 1995. All sampling locations are indicated by river mile in Figure 1. Samples were analyzed for semivolatile organic compounds, volatile organic compounds, total organic carbon, and petroleum hydrocarbons. Specific chemical parameters tested and results are listed in Appendix Table 1.

- Sediment samples were evaluated in part using guidelines established by the Ontario Ministry of the Environment (Persaud et al. 1993). The guidelines define two levels of ecotoxic effects and are based on the chronic, long term effects of contaminants on benthic organisms. A Lowest Effect Level is a level of sediment contamination that can be tolerated by the majority of benthic organisms, and a Severe Effect Level indicates a level at which pronounced disturbance of the sediment-dwelling community can be expected. The Severe Effect Level is the sediment concentration of a compound that would be detrimental to the majority of benthic species. When any parameters are at or above the Severe Effect Level guideline, the material tested is considered highly contaminated and will likely have a significant effect on benthic biological resources. Based on the guidelines noted above, six sediment samples exceeded the Lowest Effect Level based on PAH contaminants (Table 3). The highest levels of PAH compounds were found upstream from the oil spill area. Eleven of the PAH chemicals tested were reported at levels above the Lowest Effect Level. Hexachlorobenzene was documented at the Severe Effect Level both upstream and downstream from the spill location. The guidelines detailed in Persaud et al. (1993) do not include evaluations of volatile organic compounds, several PAHs and metals, and most non-PAH semivolatile organic compounds.
- Benzene was detected in Tuscarawas River sediment immediately downstream from the spill site; however, the concentration appeared to be low.
- Diesel range heavy total petroleum hydrocarbons (TPH) were detected at substantially higher levels in the sediment of the Tuscarawas River immediately downstream from the oil spill location. Upstream from the spill area (at RM 81.45), petroleum hydrocarbons were documented at 300 mg/kg. A ten-fold increase in petroleum hydrocarbons occurred in the Tuscarawas River sediments at RM 79.97, where a concentration of 3100 mg/kg was measured. Other downstream sampling locations had TPH levels comparable to the upstream background site. It appears that the elevated TPH level at RM 79.97 contributed to interference with the other organics, resulting in the high sample detection levels.

Table 3. Summary of select organic chemical parameters measured in the sediment of the Tuscarawas River, June 1995. The oil spill occurred in the Tuscarawas River at river mile 79.98. Measurements in **bold** exceed the Lowest Effect Level as detailed in Persaud et al. 1993. Parameters exceeding the Severe Effect Level are indicated by underlined **bold** numbers. Parameters in *italics* do not have review guidelines established in Persaud et al. 1993.

		Samp	ling Locati	on (River	Mile)									
Parameter	81.45	79.97	78.06	73.64	71.62	68.72	68.81							
(ug/kg)					- 7.507									
Benzene	<17	25J	<15	<25	16J	<29	3Ј							
Chorobenzene	<17	250	<15	<25	<19	<29	<19							
1,4-Dichlorobenzene	<2600	2000J	<900	< 2000	<820	<730	<590							
Hexachlorobenzene	15,000	<22,000	5400	7900	3000	4500	1400							
3,3-Dichlorobenzidine	1700J	<22,000	300J	320J	$\frac{3000}{300J}$	$\frac{4500}{1000}$	300J							
Naphthalene	180J	<22,000	36J	<2000	<820	290J	55J							
2-Methylnaphthalene	250J	<22,000	42J	65J	45J	250J	66J							
Acenaphthylene	55J	<22,000	<900	<2000	<820	<730	<590							
Acenaphthene	160J	<22,000	37J	<2000	<820	120J	<590							
Dibenzofuran	180J	<22,000	39J	<2000	<820	100J	24J							
Fluorene	210J	<22,000	44J	<2000	<820	240J	< 590							
Phenanthrene	2000J	530J	510J	270J	270J	1800	310J							
Anthracene	590J	<22,000	76J	33J	22J	330J	43J							
Carbazole	270J	<22,000	130J	<2000	<820	<730	< 590							
Fluoranthene	3600	<22,000	720J	680J	550J	2300	530J							
Pyrene	2500J	<22,000	540J	520J	500J	2100	460J							
Chrysene	2000J	<22,000	320J	400J	310J	970	330J							
Benzo(b)fluoranthene	1600J	<22,000	300J	540J	360J	<730	410J							
Benzo(k)fluoranthene	1300J	<22,000	250J	350J	<820	800	390J							
Benzo(a)pyrene	1600J	<22,000	200J	300J	160J	590J	230J							
Indeno(1,2,3-cd)pyrene	800J	<22,000	94J	120J	63J	230J	74J							
Dibenzo(a,h)anthracene	150J	<22,000	27J	< 2000	<820	<730	< 590							
Benzo(g,h,i)perylene	640J	<22,000	96J	100J	58J	260J	59J							
Total PAHs	17,635J	530J	3292J	3378J	2338J	10,280J	2957J							
(mg/kg)		2000000												
Petroleum hydrocarbon		3100	63	160	320	650	180							
Total Organic Carbon	7510	7390	21,300	19,900	26,400	25,000	4720							

J - Value is estimated. The value is less than the Contract Required Quantitation Limit but greater than zero.

Physical Habitat for Aquatic Life

Physical habitat was evaluated in the Tuscarawas River at each 1995 biological sampling location. Qualitative Habitat Evaluation Index (QHEI) scores are detailed in Table 4.

- Stream morphology in the Tuscarawas River within the study area is primarily free-flowing and consists of pools interspersed with well developed riffle and run habitats. Two sections of river are impounded; one by a low-head dam in Zoar and one by a flow controlled dry dam (Dover dam). Bottom substrates are predominated by cobble, gravel, and sand. Qualitative Habitat Evaluation Index (QHEI) scores for the Tuscarawas River within the study area ranged between 63.0 and 80.5, with a mean value of 73.1. These scores are indicative of good stream and riparian habitat and reflect conditions which are easily capable of supporting WWH stream fish communities.
- The fish sampling site at RM 73.4 had the lowest QHEI score (63) within the study area.
 This lower score was due in part to the lack of riffle and run habitats within the sampling
 zone. The other fish sampling sites within the study area were composed of pool, riffle and
 run habitats.
- River flow conditions were different between the first and second sampling pass at RM 64.1. This sampling location is influenced by the flow control structures in the Dover dam. During the first sampling pass in June, river flow was being impounded by the control structures during the oil spill recovery phase. Flow controls were not evident during the second fish sampling pass in August. The QHEI score for RM 64.1 reflects the conditions of the river during the August sampling event.

Table 4. Qualitative Habitat Evaluation Index (QHEI) matrix showing modified and warmwater habitat characteristics for the Tuscarawas River study area, 1995.

				WW	ΗA	ttributes				MWI	H Attri	butes						
								High I	nfluen	ce	M	loderai	e Influ	ence				
Ke Ql Cc	ey HEI ompone	ents	No Chamelization or Recovered Boulder/Cobble/Gravel Substrates	Slit Free Sulztrates Good/Excellent Substrates	M oderate/High Sinucsity Extensive/M oderate Cover	Fast Current/Eddies .ow/N crnal Ov eral Embeddedness Max. Depth > 40 cm .ow/N o Riffle Embeddness	LAttributes	Channelized or No Recovery Slithfuck Substrates	Low similarly SparseWoCover Max. Depth < 40 cm (WD/HW)	Dotal H.I. MWH Attributes	Recovering Channel HeavyM oderate Silt Cover	Sand Suitstrates (Boat) Hardpan Substrate Origin Fair/Poor Development	ocstry ver Types & Poor Pools	No Fast Current High/M od. Overall Embeddedness	High/M od. Kille Embeddedness N o Rifte	Total M.I. MWH Attributes	WWHRatio	WWH Ratio
River Mile	QHEI	Gradient (ft/mile)	No Chameli Boulder/Cob	Silt Free Substrates Good'Excellent Sul	Moderate/H) Extensive/M	Fast CurrenvEddies Low/NormalOverall Max. Depth > 40 cm Low/No Riffle Embe	Total WWH Attributes	Channelized or NoR SilvMuck Sukstrates	Low Smucaty Sparse/NoCover Max. Depth < 40	Total H.L. M	Recovering Channel Heary Moderate Sil	Sand Substrates (Boat) Hardpan Substrate Orig Fair/Poor Development	Lowin o smucsity Only 1-2 Cover Types Intermittent & Poor Pools	No Fast Current High/Mod. Over	nigava og. r No Rifte	Total M.I. M	MWH HL/WWH Ratio	MWH M.L.WWH Ratio
(17-500)	Tuscara	was River																
Year:	95																	
81.4	73.0	1.28					7		•	1	A	A	A	Δ		4	0.25	0.75
79.8	73.5	2.89					7		•	1	A	A	A	_		4	0.25	0.75
78.2	74.0	2.89					7			0	A	A	A	Δ		4	0.13	0.63
73.4	63.0	1.23					5		•	1	A		A	A 4	_			1.33
70.8	77.5	1.23					7			0	A	A	A 4	4			0.13	
68.7	80.5	1.23					8			0	A		A	A A			0.11	
64.1	70.5	1.23					5		•	1	A		A	A A			0.33	

Macroinvertebrate Community

Macroinvertebrate communities were sampled during the summer of 1995 at seven locations in the Tuscarawas River from Riverland Rd. (RM 81.4) to upstream from Dover dam (RM 64.9) (Table 1). Two qualitative samples were collected, the first in June when the artificial substrates were set and the usual sample when the artificial substrates were retrieved in August. Summarized results from the 1995 macroinvertebrate sampling are compiled in Tables 5 and 6. ICI metrics, scores, and raw data tables sampled by river mile are attached as Appendix Tables 2 and 3. Also included in Table 5 are data collected in 1989 by the Ohio EPA.

- The upstream site (RM 81.4) in the study area had a light oily film on the water surface but no oil along the margins or on woody debris and rocks. The site just downstream from the spill (RM 79.8) had an oily sheen on the water surface with some oil along the margins. The sites further downstream (RMs 78.2 64.9) had a heavy coating of oil along the stream margins and on woody debris.
- The upstream site at Riverland Rd. (RM 81.4) supported a macroinvertebrate community in the marginally good range in June with 23 taxa including 3 EPT taxa collected. The artificial substrates were washed downstream by high water and were lying on their side. In spite of the sampler disturbance, the community had improved in August into the very good range with an ICI score of 40 with 46 total taxa and 39 qualitative taxa including 9 EPT taxa collected. There were 1316 organisms collected from the artificial substrates with the abundances of relatively pollution sensitive caddisflies, mayflies, and tanytarsini midges comprising 89.4% of the sample; only 0.8 % of the sample was classified as pollution tolerant organisms.
- The site just downstream from the spill (RM 79.8) was approximately 150 meters downstream from the pipeline. The macroinvertebrate community was in the marginally good range in June with 21 taxa including 3 EPT taxa collected. There was an oily sheen on the water and some along the stream margins but good current velocity seemed to prevent the oil from settling out. The macroinvertebrate community had improved by August into the exceptional range with an ICI score of 46, exceeding the WWH ecoregional biocriterion and meeting the EWH biocriterion. There were 41 total taxa and 31 qualitative taxa collected including 12 EPT taxa. There were 1765 organisms collected from the artificial substrates with the abundances of relatively pollution sensitive caddisflies, mayflies, and tanytarsini midges comprising 87.7% of the sample; only 1.5% of the sample was classified as pollution tolerant organisms.
- The site at Dolphin Rd. (RM 78.2) was approximately 1.7 miles downstream from the oil spill and had a macroinvertebrate community in June in the marginally good range with 24 taxa including 4 EPT taxa collected. Of all the locations sampled in the Tuscarawas River study area in 1995, this site showed the least improvement in the macroinvertebrate community between June and August. The macroinvertebrates, in August, indicated a community in the good range with an ICI score of 34, attaining the ecoregional biocriterion for the WWH use designation. There were 42 total taxa and 25 qualitative taxa collected including 9 EPT taxa. Of the 974 organisms collected from the artificial substrates the abundances of relatively pollution sensitive caddisflies, mayflies, and tanytarsini midges comprised only 57.7 % of the sample; 16.6% of the organisms were classified as pollution tolerant. These results indicated a lasting, though minor, impact on the macroinvertebrate

community at this site relative to the other locations in the study area.

- Upstream from Bolivar at I-77 (RM 73.6) the macroinvertebrate community, in June, was in the poor range with 15 taxa and no EPT taxa collected. By August the macroinvertebrate community performance had improved into the very good range with an ICI score of 42, exceeding the ecoregional WWH biocriterion. There were 46 total taxa and 29 qualitative taxa collected including 10 EPT taxa. There were 737 organisms collected from the artificial substrates with the abundances of relatively pollution sensitive caddisflies, mayflies, and tanytarsini midges comprising 76.6% of the sample; 3.0% of the sample was classified as pollution tolerant organisms.
- Downstream from Bolivar at State Route 212 (RM 71.6) the results from the June qualitative sample indicated fair conditions in the macroinvertebrate community with 18 taxa including 3 EPT taxa collected. In August, the macroinvertebrate community condition had improved into the very good range with an ICI score of 42, exceeding the ecoregional WWH biocriterion. There were 58 total taxa and 37 qualitative taxa collected, including 13 EPT taxa. There were 1515 organisms collected from the artificial substrates with the abundances of relatively pollution sensitive caddisflies, mayflies, and tanytarsini midges comprising 75.9% of the sample; 3.5% of the sample was classified as pollution tolerant organisms. This site consisted of an extended run with woody debris serving functionally as riffle habitat. During the June sampling the woody debris was coated in oil holding very few organisms; however, during the August sampling the woody debris was much cleaner and held large numbers of organisms, including an abundance of caddisflies and mayflies.
- The site at Zoar (RM 68.7) was located approximately one mile downstream from the Wilkshire Hills WWTP discharge. The June qualitative sample indicated a macroinvertebrate community in the poor range with 10 taxa and no EPT taxa collected. In August the results indicated the community had improved into the very good range with an ICI score of 42 with 46 total taxa and 27 qualitative taxa collected including 8 EPT taxa. Of the 1696 organisms collected from the artificial substrates, the abundances of relatively pollution sensitive caddisflies, mayflies, and tanytarsini midges comprised 80.5% of the sample; 1.8% of the sample was classified as pollution tolerant organisms.
- The most downstream site in the study area was just over one mile upstream from the Dover dam (RM 64.9). The June results indicated the macroinvertebrate community was in the poor range with 9 taxa including 1 EPT taxon collected. The artificial substrates were washed out by high water and, therefore, an ICI score was not available. The August results for qualitative sampling indicated the macroinvertebrate community had improved into the very good range with 33 taxa collected including 9 EPT taxa.

Table 5. Summary of macroinvertebrate data collected from artificial substrates (quantitative sampling) and from natural substrates (qualitative sampling) in the Tuscarawas River in 1989 and 1995. The Tuscarawas River within the study area has a WWH aquatic life use designation in the Ohio Water Quality Standards.

Stream/ River Mile	Relative Density	Total Taxa	Quant. Taxa	Qual. Taxa	Qual. EPTa	ICI	Evaluation		
Tuscarawas R	iver - 1995								
	Erie-Ontar	io Lake P	lain Ecore	egion - WV	WH Use De	esionation	7		
81.4	263	46	25	39	9	40	Very Good		
79.8	353	41	28	31	12	46	Exceptional		
78.2	195 Wastern All	42	35	25	9	.34	Good		
73.6	Western Alle 147	egneny Fu 46	aieau Ecoi	region - W					
73.0	147	40	32	29	10	42	Very Good		
71.6	303	58	41	37	13	42	Very Good		
68.7	339	46	36	27	8	42	Very Good		
64.9	~	540	2	33	9	泵	Very Good		
Tuscarawas R	iver- 1989								
	Erie-Ontar	io Lake P	lain Ecore	gion - WV	VH Use De	signation	1		
31.4	785	62	39	51	14	34	Good		
78.2	966	66	43	51	9	40	Very Good		
	Western Alle	egheny Pla	ateau Ecor	region - W	WH Use D	esignatio	n		
73.6	1150	52	34	38	8	42	Very Good		
68.8	3070	52	29	42	9	42	Very Good		

Ecoregion Biocriteria: Erie-Ontario Lake Plain (EOLP)/ Western Allegheny Plateau (WAP) (from Ohio Administrative Code 3745-1-07, Table 7-17)

INDEX	WWH	EWH	MWHc
ICI	34/36	46/46	22/22

^{*} Significant departure from ecoregional biocriterion (>4 ICI units); poor and very poor results are underlined.

ns Nonsignificant departure from ecoregional biocriterion (\le 4 ICI units).

a EPT= total Ephemeroptera (mayflies), Plecoptera (stoneflies) and Trichoptera (caddisflies) taxa richness.

b The narrative evaluation using the qualitative sample is based on best professional judgment utilizing sample attributes such as taxa richness, EPT taxa richness, and community composition and is used in lieu of the ICI when artificial substrates are not collected or retrieved.

c Modified Warmwater Habitat for channel modified areas.

Table 6. Summary of macroinvertebrate data collected from natural substrates (qualitative sampling) in the Tuscarawas River, 1995.

Stream/ River Milea			QCTV	Evaluation
Tuscarawas Riv	per - 1995			
	Erie-Ontario Lake P	lain Ecoregion - W	WH Use Design	ation
81.4A 81.4B	23 39	39	35.6 38.6	Marginally Good Very Good
79.8A 79.8B	21 31	3 12	34.2 38.9	Marginally Good Exceptional
78.2A 78.2B	24 25	4 9	32.9 38.9	Marginally Good Good
	Western Allegheny Pla	iteau Ecoregion - V	WWH Use Design	ation
73.6A	15	0	30.1	Poor
73.6B	29	10	38.2	Very Good
71.6A 71.6B	18 37	3 13	32.6 39.2	Fair Very Good
68.7A	10	0	32.9	200 0420 - 00 - 0 30000 0000 000
68.7B	27	8	34.6	Poor Very Good
64.9A	9	1	31.3	Poor
64.9B	33	9	38.9	Very Good

a - A denotes the June macroinvertebrate collection, B denotes the August macroinvertebrate collection.

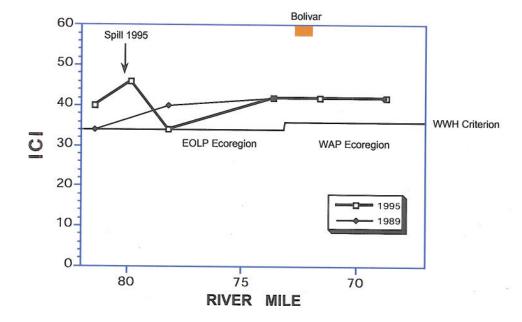


Figure 2. Longitudinal performance of the Invertebrate Community Index (ICI) in the Tuscarawas River for 1989 and 1995.

Fish Community

A total of 1,055 fish representing 34 species and three hybrids were collected from the Tuscarawas River between June and August, 1995. The sampling effort included a cumulative distance electrofished of 7.10 km at seven locations. (Table 7, Figure 1). Relative numbers and species collected per location are presented in Appendix Table 4. Sampling locations were evaluated using Warmwater Habitat biocriteria.

- Common carp (33.7%) and northern hog sucker (25.9%) predominated the catch numerically, while common carp dominated by weight (84.8%). Top carnivores (rock bass, smallmouth bass, largemouth bass, northern pike, bowfin, and warmouth sunfish) comprised 7.5% of the fish community.
- The fish communities from the four most upstream sampling locations (RMs 81.4 73.4; Riverland Rd. to I-77) exhibited substantial biological degradation. The IBI (20 26) and MIwb (4.7 5.6) scores were reflective of very poor to fair conditions and the entire stream reach was not achieving the applicable biocriteria. These conditions were observed upstream and downstream from the oil spill location.
- Improved fish community results were noted between RMs 70.8 and 68.7 (Bolivar golf course to Zoar). IBI (30 33) and MIwb (6.6 6.8) scores were in the fair range, with increased numbers of fish and species richness observed in comparison to upstream sites. Although an improvement in the fish community was documented, these two sites were not fully achieving the appropriate biocriteria.
- The most downstream fish sampling location (RM 64.1) occurred within 0.5 miles of the Dover dam. This site was influenced by flow regulation during the June sampling event. As a result, a substantial decline in IBI and MIwb scores were reported in June (IBI= 14, MIwb= 3.8) in comparison to the August (IBI= 22, MIwb= 5.5) sampling event. Overall sampling results at RM 64.1 reflected very poor to poor conditions.
- The physical condition of fish was monitored at each sampling site by recording the incidence of gross DELT (deformities, fin erosions lesions/ulcers and tumors) external anomalies. Biosurvey results collected by Ohio EPA from throughout the state show a high frequency of DELT anomalies to be an accurate indication of pollution stress usually caused by multiple sublethal stresses as the result of degraded water quality (i.e. often a combination of toxic impacts combined with marginal D.O. concentrations). Within Ohio, there are ample coincidences between sites containing chemically contaminated sediments (e.g. metals, PAHs) and very high percent occurrence of DELT anomalies (>10-20%) in combination with very low Index of Biotic Integrity and Modified Index of Well-Being scores (Yoder 1991). A high percentage of DELT anomalies were recorded at each sampling location, with site results ranging between 8.4 and 26.3%. A majority of the DELT anomalies were deformities on adult common carp. Some fish species (rock bass, smallmouth bass, yellow bullhead) collected downstream from the oil spill area had black material coating the outer edge of pelvic, anal, caudal and pectoral fins (Plate 1).

Table 7. Fish community indices from the Tuscarawas River, 1989 and 1995 based on pulsed D.C. boat electrofishing at sites sampled by Ohio EPA. Relative number and weight are per 1.0 km.

Stream/ River Mile	Mean Number of Species	Cumulative Species	Mean Relative Number	Mean Relative Weight	QHEI	Mean Modified Index of Well-Being	Mean Index of Biotic Integrity	Narrative
Tuscarawas	s River - 199	05		3.5				
81.4	12.5	17	144	113.0	73.0	<u>5.5</u> *	26*	Poor/Fair
79.8	12.5	19	131	78.3	73.5	5.6*	23*	Poor
78.2	10.5	14	130	75.9	74.0	5.6 *	25*	Poor
73.4	11.0	15	109	80.0	63.0	4.7*	25* 20*	Very Poor/Poor
70.8	14.5	21	157	105.6	77.5	6.6*	30 *	Fair
68.7	16.5	24	238	140.8	80.5	6.8*	33*	Fair
64.1	9.5	13	133	201.2	70.5	<u>4.6</u> *	<u>18</u> *	Very Poor/Poor
Tuscarawas	s River - 198	39						
81.6	9.7	14	180	87.7	45.0	4.3*	17*	Very Poor/Poor
78.1	15.3	21	264	39.2	75.0	5.0*	20*	Poor
73.4	18.7	24	256	91.9	51.0	7.5*	25*	Fair/Poor
70.8	14.3	22	208	70.2	68.0	4.9*	23 *	Very Poor/Poor
68.7	18.7	27	204	72.5	90.0	<u>6.0</u> *	$\frac{20}{25}$ * $\frac{23}{26}$ *	Poor/Fair

Ecoregion Biocriteria: Erie Ontario Lake Plain (EOLP)/Western Allegheny Plateau (WAP) (from Ohio Administrative Code 3745-1-07, Table 7-17)

INDEX	WWH	EWH	MWH b
IBI - Boat	40/40	48/48	24/24
MIwb - Boat	8.7/8.6	9.6/9.6	5.8/5.8

^{*} Significant departure from ecoregional biocriteria (>4 IBI units, >0.5 MIwb units); poor and very poor results are underlined

ns Nonsignificant departure from EWH biocriteria (\leq 4 IBI units, \leq 0.5 MIwb units).

a Narrative evaluation is based on MIwb and IBI scores, when available.

b Modified Warmwater Habitat for channel modified areas.

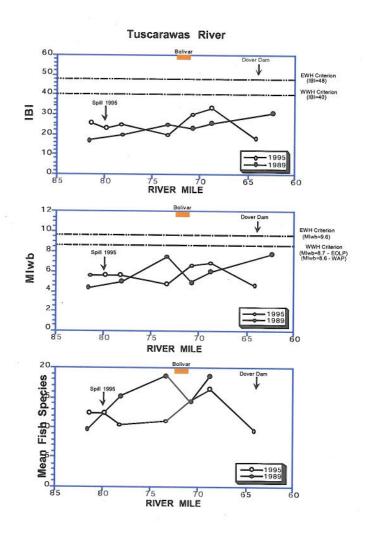


Figure 3. Longitudinal performance of the Index of Biotic Integrity (IBI), the Modified Index of Well-being (MIwb), and mean number of fish species in the Tuscarawas River, 1989 and 1995.

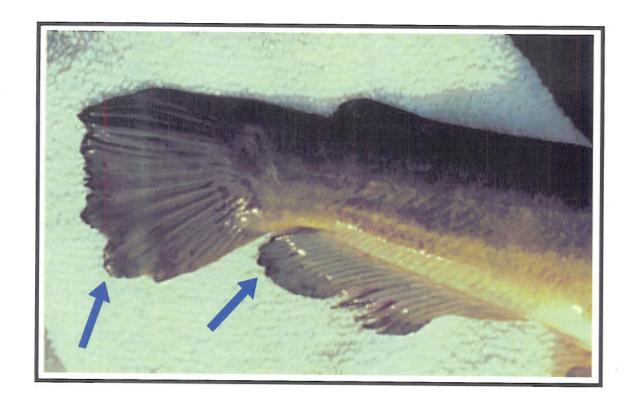


Plate 1.Photo of a yellow bullhead showing blackened fin margins; collected from the Tuscarawas River at RM 79.8, June 19, 1995.

TREND ASSESSMENT

Changes in Macroinvertebrate Performance: 1989 - 1995

• The macroinvertebrate communities between RMs 81.4 and 64.6 were sampled during 1989 as part of a larger survey of the Tuscarawas River. Historical results (Ohio EPA 1990) have indicated macroinvertebrate communities in the good to very good range, with ICI values ranging from 34 to 42. The site at RM 81.4 improved from an ICI score of 34 in 1989 to 40 in 1995. The site at RM 78.2 declined from an ICI score of 40 in 1989 to 34 in 1995. The two sites at RMs 73.6 and 68.8/68.7 were consistent with ICI scores of 42 in both 1989 and 1995. The site at RM 64.6 had an ICI score of 42 (very good) in 1989; in 1995 at RM 64.9, the narrative evaluation was also in the very good range. With the exception of the slight decline below the oil spill at RM 78.2 the macroinvertebrate communities throughout this reach of the Tuscarawas River were stable and relatively unchanged between 1989 and 1995.

Changes in Fish Community Performance: 1989 - 1995

• The fish communities between RMs 81.6 and 68.7 were sampled during 1989 as part of a larger survey of the Tuscarawas River. Historical results have indicated fish communities in the very poor to fair range, with IBI values ranging from 17 to 26 and MIwb scores ranging between 4.3 and 7.5. Four of the five 1989 sampling locations showed improvement in IBI and MIwb scores during 1995; however, 1995 results were still within the very poor to fair range and not achieving the biocriteria.

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Appendix Table 1. Sediment Chemistry.

Appendix Table 1. Tuscarawas River sediment results from samples collected in June, 1995.

SAMPLE NUMBERS		TR-01	TR-02	TR-03	TR-04	TR-05	TD 06	TD 07
DATE SAMPLE COLLECTE	ξD.	6/19/95	6/19/95	6/19/95	6/19/95		TR-06	TR-07
RIVER MILE		81.45	79.97	78.06	73.64	6/20/95	6/20/95	6/20/95
LATITUDE		4004140	4004045	4003911	4003947	71.62 4003829	68.72	64.81
LONGITUDE		8103013	8102914	8102912	8102621	8102701	4003633 8102543	400340
			0102914	0102912	0102021	0102/01	8102343	8102404
VOLATILE ORGANI	C COMPO	DUNDS		15.				
chloromethane	10 ug/kg	17U	200U	15U	25U	19U	29U	19U
bromomethane	10 ug/kg	17U	200U	15U	25U	19U	29U	19U
vinyl chloride	10 ug/kg	17U	200U	15U	25U	19U	29U	19U
chloroethane	10 ug/kg	17U	200U	15U	25U	19U	29U	19U
methylene chloride	10 ug/kg	2JB	200JB	7JB	21JB	19U	10JB	17JB
acetone	10 ug/kg	17U	480	14J	25U	19U	29U	17JB
carbon disulfide	10 ug/kg	17U	200U	15U	25U	19U	29U	19U
1,1-dichloroethene	10 ug/kg	17U	200U	15U	25U	19U	29U	
1,1-dichloroethane	10 ug/kg	17U	200U	15U	25U	19U		19U
1,2-dichloroethene (total)	10 ug/kg	17U	200U	15U	25U	19U	29U 29U	19U
chloroform	10 ug/kg	17U	200U	15U	25U	19U		19U
1,2-dichloroethane	10 ug/kg	17U	200U	15U			29U	19U
2-butanone	10 ug/kg	17U	160J		25U	19U	29U	19U
1,1,1-trichloroethane	10 ug/kg	17U		15U	25U	19U	29U	19U
carbon tetrachloride	10 ug/kg	17U	200U	15U	25U	19U	29U	19U
bromodichloromethane	10 ug/kg 10 ug/kg	17U	200U	15U	25U	19U	29U	19U
1,2-dichloropropane		17U	200U 200U	15U	25U	19U	29U	19U
cis-1,3-dichloropropene	10 ug/kg			15U	25U	19U	29U	19U
trichloroethene	10 ug/kg	17U	200U	15U	25U	19U	29U	19U
dibromochloromethane	10 ug/kg	17U	200U	15U	25U	19U	29U	19U
1,1,2-trichloroethane	10 ug/kg	17U	200U	15U	25U	19U	29U	19U
benzene	10 ug/kg	17U	200U	15U	25U	19U	29U	19U
	10 ug/kg	17U	25J	15U	25U	16J	29U	3J
trans-1,3-dichloropropene	10 ug/kg	17U	200U	15U	25U	19U	29U	1 9 U
4 mothyl 2 mouton and	10 ug/kg	17U	200U	15U	25U	19U	29U	1 9 U
4-methyl-2-pentanone	10 ug/kg	17U	200U	15U	25U	19U	29 U	19U
2-hexanone	10 ug/kg	17U	200U	15U	25U	19U	29U	19U
tetrachloroethene	10 ug/kg	17U	200U	15U	25U	19U	29 U	19U
1,1,2,2-tetrachloroethane	10 ug/kg	17U	200U	15U	25U	19U	29U	19U
toluene	10 ug/kg	17U	200U	15U	25U	19U	29U	19U
chlorobenzene	10 ug/kg	17U	250	15U	25U	19U	29U	19U
ethyl benzene	10 ug/kg	17U	200U	15U	25U	19U	29U	19U
styrene	10 ug/kg	17U	200U	15U	25U	19U	29U	19U
xylenes (total)	10 ug/kg	17U	200U	15U	25U	19U	29 U	19U
SEMI-VOLATILE OR	GANIC C	OMPOU	UNDS					
- T T	CRQL							
phenol	330 ug/kg	2600U	22000U	900U	2000U	820U	730U	590U
bis(2-chloroethyl)ether	330 ug/kg	2600U	22000U	900U	2000U	820U	730U	590U
2-chlorophenol	330 ug/kg	2600U	22000U	900U	2000U	820U	730U	590U
1,3-dichlorobenzene	330 ug/kg	2600U	22000U	900U	2000U	820U	730U	590U
1,4-dichlorobenzene	330 ug/kg	2600U	2000J	900U	2000U	820U	730U	590U
1,2-dichlorobenzene	330 ug/kg	2600U	22000U	900U	2000U	820U	730U	590U

SAMPLE NUMBERS		TR-01	TR-02	TR-03	TR-04	TR-05	TR-06	TR-07
DATE SAMPLE COLLECTI	ED	6/19/95	6/19/95	6/19/95	6/19/95	6/20/95	6/20/95	6/20/95
RIVER MILE		81.45	79.97	78.06	73.64	71.62	68.72	64.81
LATITUDE		4004140	4004045	4003911	4003947	4003829	4003633	4003408
LONGITUDE		8103013	8102914	8102912	8102621	8102701	8102543	8102404
CTT TTO T				G - 64 - 54 - 54 - 54 - 54 - 54 - 54 - 54				0102101
SEMI-VOLATILE O		COMPO	UNDS					
2 mathydahanal	CRQL	260011	2200071					
2-methylphenol	330 ug/kg	2600U	22000U	900U	2000U	820U	730U	590U
2,2-oxybis(1-chloropropane)	330 ug/kg	2600U	22000U	900U	2000U	820U	730U	590U
4-methylphenol n-nitroso-di-n-dipropylamine	330 ug/kg	2600U	22000U	900U	2000U	820U	730U	590U
1 12	330 ug/kg	2600U	22000U	900U	2000U	820U	730U	590U
hexachloroethane	330 ug/kg	2600U	22000U	900U	2000U	820U	730U	590U
nitrobenzene	330 ug/kg	2600U	22000U	900U	2000U	820U	730U	590U
isophorone	330 ug/kg	2600U	22000U	900U	2000U	820U	730U	590U
2-nitrophenol	330 ug/kg	2600U	22000U	900U	2000U	820U	730U	590U
2,4-dimethylphenol	330 ug/kg	2600U	22000U	900U	2000U	820U	730U	590U
bis(2-chloroethoxy)methane	330 ug/kg	2600U	22000U	900U	2000U	820U	730U	590U
2,4-dichlorophenol	330 ug/kg	2600U	22000U	900U	2000U	820U	730U	590U
1,2,4-trichlorobenzene	330 ug/kg	2600U	22000U	900U	2000U	820U	730U	590U
naphthalene	330 ug/kg	180J	22000U	36J	2000U	820U	290J	55J
4-chloroaniline	330 ug/kg	2600U	22000U	900U	2000U	820U	730U	590U
hexachlorobutadiene	330 ug/kg	2600U	22000U	900U	2000U	820U	730U	590U
4-chloro-3-methylphenol	330 ug/kg	2600U	22000U	900U	2000U	820U	730U	590U
2-methylnaphthalene	330 ug/kg	250J	22000U	42J	65J	45J	250J	66J
hexachlorocyclopentadiene	330 ug/kg	2600U	22000U	900U	2000U	820U	730U	590U
2,4,6-trichlorophenol	330 ug/kg	2600U	22000U	900U	2000U	2000U	1800U	1500U
2,4,5-trichlorophenol	800 ug/kg	6400U	54000U	2300U	5100U	2000U	1800U	1500U
2-chloronaphthalene	330 ug/kg	2600U	22000U	900U	2000U	820U	730U	590U
2-nitroaniline	800 ug/kg	6400U	54000U	2300U	5100U	2000U	1800U	1500U
dimethylphthalate	330 ug/kg	2600U	22000U	900U	2000U	820U	730U	590U
acenaphthylene	330 ug/kg	55J	22000U	900U	2000U	820U	730U	590U
2,6-dinitrotoluene	330 ug/kg	2600U	22000U	900U	2000U	820U	730U	590U
3-nitroaniline	800 ug/kg	6400U	54000U	2300U	5100U	2000U	1800U	1500U
acenaphthene	330 ug/kg	160J	22000U	37J	2000U	820U	120J	590U
2,4-dinitrophenol	800 ug/kg	6400U	54000U	2300U	5100U	2000U	1800U	1500U
4-nitrophenol	800 ug/kg	6400U	54000U	2300U	5100U	2000U	1800U	1500U
dibenzofuran	330 ug/kg	180J	22000U	39J	2000U	820U	100J	24J
2,4-dinitrotoluene	330 ug/kg	2600U	22000U	900U	2000U	820U	730U	590U
diethylphthalate	330 ug/kg	2600U	22000U	51J	2000U	820U	730U	590U
4-chlorophenyl-phenyl ether	330 ug/kg	2600U	22000U	900U	2000U	820U	730U	590U
fluorene	330 ug/kg	210J	22000U	44J	2000U	820U	240J	590U
4-nitroaniline	800 ug/kg	6400U	54000U	2300U	5100U	2000U	1800U	1500U
4,6-dinitro-2-methylphenol	800 ug/kg	6400U	54000U	2300U	5100U	2000U	1800U	1500U
n-nitrosodiphenylamine	330 ug/kg	2600U	22000U	900U	2000U	820U		
4-bromophenyl-phenyl ether	330 ug/kg	2600U	22000U	900U	2000U	820U	730U 730U	590U
hexachlorobenzene	330 ug/kg	15000	22000U	5400	7900	3000		590U
pentachlorophenol	800 ug/kg	6400U	54000U	2300U	5100U		4500	1400
phenanthrene	330 ug/kg	2000J	530J	510J	270J	2000U	1800U	1500U
anthracene	330 ug/kg	590J	22000U	76J	33J	270J 22J	1800	310J
		2703	220000	703	333	ZZJ	330J	43J

SAMPLE NUMBERS	TR-01	TR-02	TR-03	TR-04	TR-05	TR-06	TR-07
DATE SAMPLE COLLECTED	6/19/95	6/19/95	6/19/95	6/19/95	6/20/95	6/20/95	6/20/95
RIVER MILE	81.45	79.97	78.06	73.64	71.62	68.72	64.81
LATITUDE	4004140	4004045	4003911	4003947	4003829	4003633	4003408
LONGITUDE	8103013	8102914	8102912	8102621	8102701	8102543	8102404
SEMI-VOLATILE ORGANI	C COMPO	UNDS					
CRO							
carbazole 330 u		220001	J 130J	2000U	820U	730U	590U
di-n-butylphthalate 330 u	g/kg 460BJ	220001	J 410JB	590JB	570JB	390JB	360JB
fluoranthene 330 u		220001		680J	550J	2300	530J
pyrene 330 u	g/kg 2500J	220001	J 540J	520J	500J	2100	460J
butylbenzylphthalate 330 u	g/kg 2600U	220001	J 85JB	2000U	40JB	730U	590U
3,3-dichlorobenzidine 330 u	g/kg 1700J	220001	J 300J	320J	300J	1000	300J
benzo(a)anthracene 330 u	g/kg 2600U	220001	J 900U	2000U	820U	730U	590U
chrysene 330 u	g/kg 2000J	220001	J 320J	400J	310J	970	330J
bis(2-ethylhexyl)phthalate 330 u	g/kg 440BJ	220001	J 520JB	1400JB	460JB	750B	190JB
di-n-octylphthalate 330 u	g/kg 2600U	220001	J 900U	2000U	750J	730U	590U
benzo(b)fluoranthene 330 u	g/kg 1600J	220001	J 300J	540J	360J	730U	410J
benzo(k)fluoranthene 330 u	g/kg 1300J	220001	J 250J	350J	820U	800	390J
benzo(a)pyrene 330 u	g/kg 1600J	220001	J 200J	300J	160J	590J	230J
indeno(1,2,3-cd)pyrene 330 u	g/kg 800J	220001	J 94J	120J	63J	230J	74J
dibenzo(a,h)anthracene 330 u	g/kg 150J	220001	J 27J	2000U	820U	730U	590U
benzo(g,h,i)perylene 330 u	g/kg 640J	220001	J 96J	100J	58J	260J	59J
OTHER ANALYSIS							
EQL							
total organic carbon 100 m	g/kg 7510	7390	21300	19900	26400	25000	4720
petroleum hydrocarbons 20 mg	/kg 300	3100	63	160	320	650	180

J - Value is estimated. The value is less than the CRQL but greater than zero.

U- Compound was analyzed for but not detected.

B- Analyte found in associated blank as well as in the sample. Indicates probable blank contamination. CRQL- Contract Required Quantitation Limit.

EQL- Estimated Quantitation Limit.

Collection Date: 06/19/95 River Code: 17-500

Number of Organisms: 0

Qual EPT:

River: Tuscarawas River

RM: 81.40 A

Taxa Code	Taxa	Quan	/Qual	Taxa Code	Taxa	Quan/Qual
03360	Plumatella sp	0	+		23	
03600	Oligochaeta	0	+			
05800	Caecidotea sp	0	+			
06800	Gammarus sp	0	+			
08250	Orconectes (Procericambarus) rusticus	0	+			
22001	Coenagrionidae	0	+			
22300	Argia sp	0	+			
52200	Cheumatopsyche sp	0	+			
52430	Ceratopsyche morosa group	0	+			
52530	Hydropsyche depravata group	0	+			
63300	Hydroporus sp	0	+			
68708	Dubiraphia vittata group	0	+			
69400	Stenelmis sp	0	+			
74100	Simulium sp	0	+			
79085	Telopelopia okoboji	0	+			
81825	Rheocricotopus (Psilocricotopus) robacki	0	+			
84450	Polypedilum (P.) convictum	0	+			
84470	Polypedilum (P.) illinoense	0	+			
84540	Polypedilum (Tripodura) scalaenum group	0	+			
97601	Corbicula fluminea	0	+			
98600	Sphaerium sp	0	+			
99240	Lasmigona complanata	0	+			
99540	Elliptio dilatata	0	4			

02/16/96

Collection Date: 08/09/95 River Code: 17-500

Plumatella sp

Oligochaeta

Gammarus fasciatus

Baetis intercalaris

Stenonema terminatum

Tricorythodes sp

Calopteryx sp

Ranatra sp

Coenagrionidae

Stylurus spiniceps

Cheumatopsyche sp

Hydropsyche dicantha

Hydropsyche simulans

Macronychus glabratus

Hayesomyia senata or Thienemannimyia

Nanocladius (N.) crassicornus or N. (N.)

Rheocricotopus (Psilocricotopus) robacki

Polypedilum (Tripodura) scalaenum group

Hydropsyche orris

Dytiscus sp

Oreodytes sp

Paracymus sp

Stenelmis sp

Simulium sp

norena

rectinervus

Conchapelopia sp

Telopelopia okoboji

Cricotopus (C.) bicinctus

Thienemanniella xena

Tvetenia discoloripes group

Polypedilum (P.) convictum

Polypedilum (P.) illinoense

Polypedilum (P.) fallax group

Cricotopus (C.) sp

Berosus sp

Ceratopsyche morosa group

Hydropsyche depravata group

Leucrocuta sp

Orconectes (Procericambarus) rusticus

Stenonema mexicanum integrum

Taxa

Taxa Code

-500	Riv	er: Tus	carawas River		RM: 8	31.40	В
Quan	/Qual	Taxa Code	Taxa			Quan	/Qual
1		84700	Stenochironomus sp			10	
0	+	85625	Rheotanytarsus exigu	us group		71	+
1	+	86401	Atherix lantha			0	+
0	+	87540	Hemerodromia sp			7	+
16	+	95100	Physella sp			0	+
1		96900	Ferrissia sp			6	
44	+	97601	Corbicula fluminea			0	+
47	+		E				
32	+	No. Q	Quantitative Taxa:	25	Total Taxa:	46	
0	+	No. Q	Qualitative Taxa:	39	ICI:	40	
0	+		per of Organisms:	1316	Qual EPT:		
0	+	Tuille	oci of Organishis.	1310	Qual EF1.	9	
0	+						
445	+				536		
36	+						
78	+						
206	+						
3							
198	+						
0	+						
0	+						
0	+						
0	+						
0	+						
2	+						
0	+						
5							
18	+						
0	+						
0	+						
0	+						
0	+						
10	+						
0	+						
3							
66	+						
0	+						
_							

Collection Date: 06/19/95 River Code: 17-500

River: Tuscarawas River

RM: 79.80

Taxa Code	Taxa	Quan/	Qual	Taxa Code	Taxa		Quan/Qual
03360	Plumatella sp	0	+				
03600	Oligochaeta	0	+				
04901	Erpobdellidae	0	+				
05800	Caecidotea sp	0	+				
06800	Gammarus sp	0	+				
10000	Ephemeroptera	0	+				
22001	Coenagrionidae	0	+				
22300	Argia sp	0	+				
52200	Cheumatopsyche sp	0	+				
52430	Ceratopsyche morosa group	0	+				
68601	Ancyronyx variegata	0	+			15	
69400	Stenelmis sp	0	+				
77500	Conchapelopia sp	0	+				
77750	Hayesomyia senata or Thienemannimyia norena	0	+				
79100	Thienemannimyia group	0	+				
81650	Parametriocnemus sp	0	+				
81825	Rheocricotopus (Psilocricotopus) robacki	0	+				
82730	Chironomus (C.) decorus group	0	+				
84450	Polypedilum (P.) convictum	0	+				
84540	Polypedilum (Tripodura) scalaenum group	0	+				
84700	Stenochironomus sp	0	+				
	uantitative Taxa: 0 Total Ta ualitative Taxa: 21 I	xa: 21					

Number of Organisms: 0

Qual EPT:

Taxa Code	Taxa	Quan	/Qual	Taxa Code		Taxa			Quan	/Qua
03360	Plumatella sp	1	+	96900	Ferrissia	sp			18	+
03600	Oligochaeta	8	+	20 - 10 						
06810	Gammarus fasciatus	5	+	No. C	Quantitat	ive Taxa:	28	Total Taxa:	41	
08250	Orconectes (Procericambarus) rusticus	0	+	No. Q	Qualitativ	e Taxa:	31	ICI:	46	
11130	Baetis intercalaris	8	+	Numl	her of O	rganisms:	1765	Qual EPT:	12	
13400	Stenacron sp	7	+	1 (6111)	001 01 0	. Barrionio.	1705	Quai Li 1.	12	
13510	Stenonema exiguum	1								
13550	Stenonema mexicanum integrum	298	+							
13570	Stenonema terminatum	261	+							
16700	Tricorythodes sp	65	+							
17200	Caenis sp	0	+							
21200	Calopteryx sp	0	+							
22001	Coenagrionidae	0	+							
22300	Argia sp	1	+							
24900	Gomphus sp	0	+							
25610	Stylurus notatus	0	+							
48410	Corydalus cornutus	2								
52200	Cheumatopsyche sp	710	+							
52430	Ceratopsyche morosa group	78	+							
52530	Hydropsyche depravata group	44	+							
52540	Hydropsyche dicantha	24	+							
52570	Hydropsyche simulans	45	+							
52580	Hydropsyche valanis	1								
59100	Ceraclea sp	0	+							
53300	Hydroporus sp	0	+							
58601	Ancyronyx variegata	3	+							
58901	Macronychus glabratus	1								
59400	Stenelmis sp	0	+							
	Hayesomyia senata or Thienemannimyia norena	92	+							
77800	Helopelopia sp	0	+							
31825	Rheocricotopus (Psilocricotopus) robacki	25								
32141	Thienemanniella xena	3								
32820	Cryptochironomus sp	0	+							
34300	Phaenopsectra obediens group	3								
34450	Polypedilum (P.) convictum	18								
34470	Polypedilum (P.) illinoense	0	+							
34520	Polypedilum (Tripodura) halterale group	0	+							
4540	Polypedilum (Tripodura) scalaenum group	34								
4700	Stenochironomus sp	3	+							
35625	Rheotanytarsus exiguus group	6								

Collection Date: 06/19/95 River Code: 17-500

No. Qualitative Taxa:

Number of Organisms: 0

River: Tuscarawas River

RM: 78.20 A

Taxa Code	Taxa	Quan	/Qual	Taxa Code	Taxa	Quan/Qual
03360	Plumatella sp	0	+			
03600	Oligochaeta	0	+			
06001	Amphipoda	0	+			
06810	Gammarus fasciatus	0	+			
08200	Orconectes sp	0	+			
21200	Calopteryx sp	0	+			
22300	Argia sp	0	+			
34500	Perlesta placida complex	0	+			*
52200	Cheumatopsyche sp	0	+			
52430	Ceratopsyche morosa group	0	+			
52540	Hydropsyche dicantha	0	+			
69400	Stenelmis sp	0	+			
74100	Simulium sp	0	+			
77750	Hayesomyia senata or Thienemannimyia norena	0	+			
79085	Telopelopia okoboji	0	+			
30410	Cricotopus (C.) sp	0	+			
30420	Cricotopus (C.) bicinctus	0	+			
30430	Cricotopus (C.) tremulus group	0	+			
30440	Cricotopus (C.) trifascia group	0	+			
31825	Rheocricotopus (Psilocricotopus) robacki	0	+			
34450	Polypedilum (P.) convictum	0	+			
34460	Polypedilum (P.) fallax group	0	+			
34540	Polypedilum (Tripodura) scalaenum group	0	+			
98600	Sphaerium sp	0	+			

ICI:

Qual EPT:

02/16/96

Collection Date: 08/01/95 River Code: 17-500

Turbellaria

Plumatella sp

Oligochaeta

Caecidotea sp

Hydracarina

Gammarus fasciatus

Baetis intercalaris

Tricorythodes sp

Corydalus cornutus

Cheumatopsyche sp

Hydropsyche dicantha

Hydropsyche simulans

Hydropsyche valanis

Ancyronyx variegata

Macronychus glabratus

Hayesomyia senata or Thienemannimyia

Natarsia species A (sensu Roback, 1978)

Rheocricotopus (Psilocricotopus) robacki

Polypedilum (Tripodura) halterale group

Ceraclea maculata

Berosus sp

Helichus sp

Stenelmis sp

Conchapelopia sp

Helopelopia sp

Telopelopia okoboji

Cricotopus (C.) bicinctus

Nanocladius (N.) distinctus

Nanocladius (N.) spiniplenus

Polypedilum (P.) convictum

Polypedilum (P.) illinoense

Rheotanytarsus exiguus group

Stictochironomus sp

Hemerodromia sp

Ceratopsyche morosa group

Hydropsyche depravata group

Argia sp

Stenonema terminatum

Orconectes (Procericambarus) rusticus

Stenonema mexicanum integrum

Taxa

Taxa

Code

01801

03360

03600

05800

06810

08250

08601

11130

13550

13570

16700

22300

48410

52200

52430

52530

52540

52570

52580

59140

65800

68130

68601

68901

69400

77500

77750

77800

78401

79085

80420

81240

81270

81825

84450

84470

84520

84750

85625

87540

Quan/Qual

1

1

1

8

1

1

10

61

98

63

1

1

141

67

3

9

95

1

2

0

0

1

1

3

0

100

33

0

5

0

5

2

30

51

3

7

0

13

1

121

River: Tuscarawas River

RM: 78.20 \mathbb{B} Taxa Taxa Code Quan/Qual 96900 Ferrissia sp 33 97601 Corbicula fluminea 0 No. Quantitative Taxa: 35 Total Taxa: 42 No. Qualitative Taxa: 25 ICI: 34 Number of Organisms: 974 Qual EPT: 9

Collection Date: 06/19/95 River Code: 17-500

River: Tuscarawas River

RM: 73.60

Taxa Code	Taxa	Quar	/Qual	Taxa Code	Taxa	3	Quan/Qual
03600	Oligochaeta	0	+				
05800	Caecidotea sp	0	+				
06810	Gammarus fasciatus	0	+				
08250	Orconectes (Procericambarus) rusticus	0	+				
22300	Argia sp	0	+				
24900	Gomphus sp	0	+				
45300	Sigara sp	0	+				
79085	Telopelopia okoboji	0	+				
80420	Cricotopus (C.) bicinctus	0	+				
82820	Cryptochironomus sp	0	+				
84315	Phaenopsectra flavipes	0	+				
84450	Polypedilum (P.) convictum	0	+				
84470	Polypedilum (P.) illinoense	0	+				
96900	Ferrissia sp	0	+				
97601	Corbicula fluminea	0	+				
No. Q	uantitative Taxa: 0 Total Ta	xa: 1:	5				
No. Q	ualitative Taxa: 15	ICI:					
Numb	er of Organisms: 0 Qual E						

Collection Date: 08/01/95 River Code: 17-500

Turbellaria

Plumatella sp

Oligochaeta

Caecidotea sp

Hydracarina

Gammarus fasciatus

Baetis intercalaris

Tricorythodes sp

Cheumatopsyche sp

Hydropsyche dicantha

Hydropsyche simulans

Ancyronyx variegata

Dubiraphia bivittata

Dubiraphia vittata group

Macronychus glabratus

Hayesomyia senata or Thienemannimyia

Nanocladius (N.) crassicornus or N. (N.)

Rheocricotopus (Psilocricotopus) robacki

Glyptotendipes (Phytotendipes) sp

Hydropsyche orris

Hydroptilidae

Paracymus sp

Stenelmis sp

Helopelopia sp

rectinervus

Corynoneura lobata

Nanocladius (N.) distinctus

Thienemanniella xena

Nanocladius (N.) spiniplenus

Polypedilum (P.) convictum

Polypedilum (P.) illinoense

norena

Ceraclea enodis

Ceratopsyche morosa group

Hydropsyche depravata group

Hetaerina sp

Argia sp

Sialis sp

Stenonema terminatum

Orconectes (Procericambarus) rusticus

Stenonema mexicanum integrum

Taxa

Taxa

Code

01801

03360

03600

05800

06810

08250

08601

11130

13550

13570

16700

21300

22300

47600

52200

52430

52530

52540

52560

52570

53501

59118

67700

68601

68702

68708

68901

69400

77750

77800

80370

81231

81240

81270

81825

82141

83300

84450

84470

1

0

0

0

80

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228

85

22

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0

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145

46

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20

0

0

0

1

0

0

1

1

24

1

1

1

6

1

7

1

1

6

0

River: Tuscarawas River

RM: 73.60 B Taxa Quan/Qual Taxa Code Quan/Qual 84520 Polypedilum (Tripodura) halterale group 4 84540 Polypedilum (Tripodura) scalaenum group 3 84700 Stenochironomus sp 14 85625 Rheotanytarsus exiguus group 8 87510 Chelifera sp 1 96900 Ferrissia sp 16 97601 Corbicula fluminea 0 No. Quantitative Taxa: 32 Total Taxa: 46 No. Qualitative Taxa: 29 ICI: 42 Number of Organisms: 737 Oual EPT: 10

Collection Date: 06/20/95 River Code: 17-500

River: Tuscarawas River

RM: 71.60 A

Taxa Code		Quan	/Qual	Taxa Code	Taxa	 Quan/Qual
03600	Oligochaeta	0	+			
05800	Caecidotea sp	0	+			
06810	Gammarus fasciatus	0	+			
08260	Orconectes (Crokerinus) sanbornii sanbornii	0	+			
21200	Calopteryx sp	0	+			
22001	Coenagrionidae	0	+			
22300	Argia sp	0	+			
52200	Cheumatopsyche sp	0	+			
52430	Ceratopsyche morosa group	0	+			
52540	Hydropsyche dicantha	0	+			
74100	Simulium sp	0	+			
77500	Conchapelopia sp	0	+			
80430	Cricotopus (C.) tremulus group	0	+			
80440	Cricotopus (C.) trifascia group	0	+			
81650	Parametriocnemus sp	0	+			
84450	Polypedilum (P.) convictum	0	+			
84470	Polypedilum (P.) illinoense	0	+			
95100	Physella sp	0	+			12

No. Qualitative Taxa: 18 ICI:

Number of Organisms: 0

Qual EPT:

Taxa Code	Taxa	Quan	/Qual	Taxa Code	Taxa	Quar	ı/Qual
03360	Plumatella sp	1		80440	Cricotopus (C.) trifascia group	0	+
03600	Oligochaeta	4	+	81231	Nanocladius (N.) crassicornus or N. (N.)	3	
06810	Gammarus fasciatus	67	+		rectinervus		
08260	Orconectes (Crokerinus) sanbornii	0	+	81240	Nanocladius (N.) distinctus	12	
	sanbornii			81825	Rheocricotopus (Psilocricotopus) robacki	93	
08601	Hydracarina	2		82141	Thienemanniella xena	7	
11130	Baetis intercalaris	2		83040	Dicrotendipes neomodestus	9	
11200	Callibaetis sp	0	+	83300	Glyptotendipes (Phytotendipes) sp	3	
12200	Isonychia sp	1		84450	Polypedilum (P.) convictum	34	+
13400	Stenacron sp	0	+	84460	Polypedilum (P.) fallax group	0	+
13550	Stenonema mexicanum integrum	60	+	84470	Polypedilum (P.) illinoense	3	+
13570	Stenonema terminatum	418	+	84540	Polypedilum (Tripodura) scalaenum group	6	
16700	Tricorythodes sp	145	+	84700	Stenochironomus sp	6	
21300	Hetaerina sp	0	+	85625	Rheotanytarsus exiguus group	78	
48410	Corydalus cornutus	3		85814	Tanytarsus glabrescens group	3	
51300	Neureclipsis sp	1	+	87540	Hemerodromia sp	2	
52200	Cheumatopsyche sp	133	+	95100	Physella sp	0	+
52430	Ceratopsyche morosa group	242	+	96900	Ferrissia sp	3	
52530	Hydropsyche depravata group	2	+	97601	Corbicula fluminea	0	+
52540	Hydropsyche dicantha	21	+	200	*		
52560	Hydropsyche orris	17	+	No. Q	Quantitative Taxa: 41 Total T	axa: 58	
52570	Hydropsyche simulans	28	+	No. Q	Qualitative Taxa: 37	ICI: 42	
52580	Hydropsyche valanis	0	+	Numb	per of Organisms: 1515 Qual 1	EPT: 13	
60300	Dineutus sp	1			con or organization to to dum.	DI 1. 10	
64400	Oreodytes sp	0	+				
65800	Berosus sp	0	+				
67000	Helophorus sp	0	+				
67700	Paracymus sp	0	+		19		
68601	Ancyronyx variegata	1	+				
68702	Dubiraphia bivittata	0	+				
68708	Dubiraphia vittata group	0	+				
68901	Macronychus glabratus	6	+				
69400	Stenelmis sp	0	+				
74100	Simulium sp	2	+				
77500	Conchapelopia sp	3					
77740	Hayesomyia senata	37	+				
77800	Helopelopia sp	16					
79085	Telopelopia okoboji	0	+				
30410	Cricotopus (C.) sp	3	+				
30420	Cricotopus (C.) bicinctus	31					
30430	Cricotopus (C.) tremulus group	6	+				

Collection Date: 06/20/95 River Code: 17-500

River: Tuscarawas River

RM: 68.70

Taxa Code		Quar	/Qual	Taxa Code	Taxa	Quan/Qual
03600	Oligochaeta	0	+			· · · · · · · · · · · · · · · · · · ·
06810	Gammarus fasciatus	0	+			
08200	Orconectes sp	0	+			
22300	Argia sp	0	+			
77500	Conchapelopia sp	0	+			
77750	Hayesomyia senata or Thienemannimyia norena	0	+			
79085	Telopelopia okoboji	0	+			
80204	Brillia flavifrons group	0	+			
84470	Polypedilum (P.) illinoense	0	+			
97601	Corbicula fluminea	0	+			
No. Q	Quantitative Taxa: 0 Total Ta	axa: 1	0			
No. Q	ualitative Taxa: 10	ICI:	30			
Numb	per of Organisms: 0 Qual F	EPT:				

Taxa Code	Taxa	Quan/	/Qual	Taxa Code	Taxa		(Quan	/Qual
01801	Turbellaria	8	+	84470	Polypedilum (P.) illi	noense		10	+
03600	Oligochaeta	10	+	84480	Polypedilum (P.) laet	um group		0	+
05800	Caecidotea sp	0	+	84520	Polypedilum (Tripodu	ra) halterale	group	5	
06810	Gammarus fasciatus	27	+	84700	Stenochironomus sp			5	
08250	Orconectes (Procericambarus) rusticus	0	+	85625	Rheotanytarsus exigu	us group	8	37	
11130	Baetis intercalaris	2		85800	Tanytarsus sp			5	
13400	Stenacron sp	1		87540	Hemerodromia sp			2	
13550	Stenonema mexicanum integrum	72	+						
13570	Stenonema terminatum	535	+	No. Q	Quantitative Taxa:	36	Total Taxa:	46	
16700	Tricorythodes sp	117	+	No. C	Qualitative Taxa:	27	ICI:	42	
17200	Caenis sp	0	+		per of Organisms:		Qual EPT:	8	
25620	Stylurus spiniceps	0	+	Nulli	oei oi Oigainsins.	1090	Quai EP1:	0	
48410	Corydalus cornutus	1							
52200	Cheumatopsyche sp	181	+	10					
52430	Ceratopsyche morosa group	250	+						
52530	Hydropsyche depravata group	2							
52540	Hydropsyche dicantha	88	+						
52560	Hydropsyche orris	14	+						
52570	Hydropsyche simulans	1							
52801	Potamyia flava	9							
53501	Hydroptilidae	1							
68130	Helichus sp	0	+						
68601	Ancyronyx variegata	3							
68901	Macronychus glabratus	8	+						
74100	Simulium sp	4							
77750	Hayesomyia senata or Thienemannimyia norena	92	+						
79085	Telopelopia okoboji	10							
30410	Cricotopus (C.) sp	10	+						
30420	Cricotopus (C.) bicinctus	10	+						
30430	Cricotopus (C.) tremulus group	0	+						
31231	Nanocladius (N.) crassicornus or N. (N.) rectinervus	5							
81825	Rheocricotopus (Psilocricotopus) robacki	68							
32200	Tvetenia bavarica group	5							
32220	Tvetenia discoloripes group	5							
32730	Chironomus (C.) decorus group	0	+						
32820	Cryptochironomus sp	0	+						
33040	Dicrotendipes neomodestus	0	+						
33300	Glyptotendipes (Phytotendipes) sp	19	+						
	Polypedilum (P.) convictum	24	+						

Collection Date: 06/20/95 River Code: 17-500

River: Tuscarawas River

RM: 64.90 A

Taxa Code	Taxa	Qua	an/Qu	Taxa al Code	Taxa		Quan/Qual
03360	Plumatella sp	(0 +			SE	
03600	Oligochaeta	(0 +				
06810	Gammarus fasciatus		0 +				
08200	Orconectes sp	(0 +				
22300	Argia sp	(0 +				
24900	Gomphus sp	(0 +				
52560	Hydropsyche orris	(0 +				
77500	Conchapelopia sp	C	0 +				
82820	Cryptochironomus sp	C) +				
No. Q	uantitative Taxa: 0	Total Taxa:	9				
No. Q	ualitative Taxa: 9	ICI:					
Numb	per of Organisms: 0	Qual EPT:					

Collection Date: 08/02/95 River Code: 17-500

Number of Organisms: 0

Qual EPT:

River: Tuscarawas River

RM: 64.90 B

Taxa Code	Taxa	Quan	/Qual	Taxa Code	Taxa		Quan/Qua
01801	Turbellaria	0	+), (1), (2), (3), (3), (3), (3), (3), (3), (3), (3		· · · · · · · · · · · · · · · · · · ·	
03360	Plumatella sp	0	+				
06810	Gammarus fasciatus	0	+				
08260	Orconectes (Crokerinus) sanbornii sanbornii	0	+				
13400	Stenacron sp	0	+				
13550	Stenonema mexicanum integrum	0	+				
13570	Stenonema terminatum	0	+				
16700	Tricorythodes sp	0	+				
23909	Boyeria vinosa	0	+				
45100	Palmacorixa sp	0	+				
48210	Chauliodes pectinicornis	0	+				
52200	Cheumatopsyche sp	0	+				
52430	Ceratopsyche morosa group	0	+				
52540	Hydropsyche dicantha	0	+				
52560	Hydropsyche orris	0	+				
52570	Hydropsyche simulans	0	+				
68601	Ancyronyx variegata	0	+				
68702	Dubiraphia bivittata	0	+				
58901	Macronychus glabratus	0	+				
59400	Stenelmis sp	0	+				
74100	Simulium sp	0	+				
80410	Cricotopus (C.) sp	0	+	27			
30420	Cricotopus (C.) bicinctus	0	+				
31250	Nanocladius (N.) minimus	0	+				
81825	Rheocricotopus (Psilocricotopus) robacki	0	+				
32141	Thienemanniella xena	0	+				
32820	Cryptochironomus sp	0	+				
34060	Parachironomus pectinatellae	0	+				
	Polypedilum (P.) convictum	. 0	+				
34470	Polypedilum (P.) illinoense	0	+				
34700	Stenochironomus sp	0	+				
35625	Rheotanytarsus exiguus group	0	+				
97601	Corbicula fluminea	0	+				

Appendix Table 3. Invertebrate Community Index (ICI) metrics and scores for the Tuscarawas River study area, 1995.

ICI metric summary for the Tuscarawas River, 1989-95.

	Drainage		Num	ber of				Percent	:				
River Mile	Area (sq mi)	Total Taxa	Mayfly Taxa	Caddisfly Taxa	Dipteran Taxa	Mayflies	Caddis- flies	Tany- tarsini	Other Dipt/NI	Tolerant Taxa	Qual. EPT	Eco- region	ICI
TUSCA	RAWAS	RIVE	R — 17	-500									
Year: 9	95												
81.40	B 547.0	25(4)	5(2)	6(6)	10(4)	10.6(2)	73.4(6)	5.4(2)	10.4(6)	0.8(6)	9(2)	3	40
79.80	B 550.0	28 (4)	6(4)	6(6)	8(2)	36.3(6)	51.1(6)	0.3(2)	11.9(6)	1.5(6)	12(4)	3	46
78.20	B 580.0	35 (6)	4(2)	7(6)	11(4)	23.8(4)	32.6(6)	1.3(2)	41.5(2)	16.6(0)	9(2)	3	34
73.60	B 586.0	32 (4)	4(2)	6(6)	15(6)	46.1(6)	29.4(6)	1.1(2)	22.9(4)	3.0(4)	10(2)	3	42
71.60	B1092.0	41(6)	5(2)	7(6)	20(6)	41.3(6)	29.3(4)	5.3(2)	23.3(4)	3.5(2)	13 (4)	4	42
	B1103.0	36(6)	5(2)	8(6)	17(6)	42.9(6)	32.2(4)	5.4(2)	18.8(4)	1.8(4)	8(2)	4	42
Year: 8	39												
81.40	547.0	39(6)	5(2)	6(6)	13 (4)	10.0(2)	12.0(2)	14.2(2)	61.4(0)	1.7(6)	14(4)	3	34
78.20	580.0	43 (6)	6(4)	5(4)	15(6)	46.4(6)	22.2(4)	6.2(2)	22.3(4)	5.3(2)	9(2)	3	40
73.60	586.0	34(4)	5(2)	6(6)	15(6)	42.9(6)	27.7(4)	4.4(2)	24.1(4)	1.9(6)	8(2)	3	42
68.80	1103.0	29(4)	4(2)	8(6)	12(6)	5.8(2)	69.0(6)	10.6(2)	14.5(6)	0.9(6)	9(2)	4	42

Appendix Table 4. Summary of relative numbers and weight of fish and species collected at each location by river mile sampled in the Tuscarawas River area, 1995. Relative numbers are per 1.0 km.

		1 ugc 1
River Code: 17-500	Stream: Tuscarawas River	Sample Date: 1995
River Mile: 81.40	Basin: Muskingum River	Date Range: 06/19/95
Data Source: 01	Time Fished: 2844 sec Drain Area: 547.0 sq mi	Thru: 08/24/95
Purpose:	Dist Fished: 1.00 km No of Passes: 2	Sampler Type: A

Species Name / Stage / ODNR Status			Bree Guild		# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
NORTHERN PIKE (C)	F	Р	М		1	1.00	0.69	0.02	0.01	16.00
QUILLBACK CARPSUCKER (C)	C	0	M		1	1.00	0.69	0.63	0.56	634.00
SILVER REDHORSE (C)	R	1	S	M	1	1.00	0.69	0.38	0.33	378.00
NORTHERN HOG SUCKER (C)	R	1	S	M	27	27.00	18.75	5.34	4.73	197.90
WHITE SUCKER (C)	W	0	S	Т	27	27.00	18.75	4.20	3.71	155.43
COMMON CARP (C)	G	0	M	Т	58	58.00	40.28	96.05	85.01	1,656.08
SPOTFIN SHINER (C)	Ν	1	M		4	4.00	2.78	0.04	0.04	10.75
BLUNTNOSE MINNOW (C)	Ν	0	C	Т	2	2.00	1.39	0.01	0.00	2.50
COM. CARP X GOLDFISH (C)	G	0		T	3	3.00	2.08	0.59	0.53	198.00
CHANNEL CATFISH (C)	F		С		5	5.00	3.47	2.90	2.57	579.80
YELLOW BULLHEAD (C)		1	C	T	1	1.00	0.69	0.38	0.33	376.00
BROWN BULLHEAD (C)		1	C	T	1	1.00	0.69	0.27	0.24	272.00
TROUT-PERCH (C)		1	M		1	1.00	0.69	0.01	0.01	12.00
ROCK BASS (A)	S	C	C		2	2.00	1.39	0.28	0.25	138.50
SMALLMOUTH BASS (A)	F	C	C	M	4	4.00	2.78	1.71	1.51	427.75
WARMOUTH SF (C)	S	С	C		1	1.00	0.69	0.06	0.05	55.00
BLUEGILL SUNFISH (C)	S	1	C	Р	4	4.00	2.78	0.09	0.08	21.25
PUMPKINSEED SUNFISH (C)	S	1	C	Р	1	1.00	0.69	0.04	0.04	44.00
M	lile To	tal			144	144.00		112.99		
N	lumbe	r of S	peci	es	17			and the second second second second		
N	lumbei	r of H	lybric	ds	1					

	rage 2
Stream: Tuscarawas River	Sample Date: 1995
Basin: Muskingum River	Date Range: 06/19/95
Time Fished: 3202 sec Drain Area: 550.0 sq mi	Thru: 08/24/95
Dist Fished: 1.10 km No of Passes: 2	Sampler Type: A
	Basin: Muskingum River Time Fished: 3202 sec Drain Area: 550.0 sq mi

Species Name / Stage / ODNR Status			Bree		# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
GIZZARD SHAD (C)		0	М		1	1.00	0.76	0.06	0.08	62.00
SILVER REDHORSE (C)	R	1	S	M	3	2.67	2.03	3.63	4.63	1,350.00
NORTHERN HOG SUCKER (C)	R	1	S	M	33	28.67	21.86	4.73	6.03	160.34
WHITE SUCKER (C)	W	0	s	Т	25	22.50	17.15	3.39	4.33	146.00
COMMON CARP (C)	G	0	М	Т	43	39.00	29.73	63.48	81.06	1,630.85
GOLDFISH (C)	G	0	M	Т	1	0.83	0.64	0.19	0.24	226.00
CREEK CHUB (C)	N	G	N	T	1	1.00	0.76	0.00	0.01	4.00
SPOTFIN SHINER (C)	N	1	M		4	3.67	2.80	0.04	0.05	10.75
SAND SHINER (C)	Ν	1	M	M	2	2.00	1.52	0.00	0.01	2.00
BLUNTNOSE MINNOW (C)	Ν	0	С	Т	15	15.00	11.44	0.08	0.10	5.20
CENTRAL STONEROLLER (C)	Ν	Н	Ν		3	3.00	2.29	0.01	0.01	2.33
COM. CARP X GOLDFISH (C)	G	0	*	Т	1	0.83	0.64	0.22	0.28	261.00
CHANNEL CATFISH (C)	F		C		1	0.83	0.64	0.74	0.95	893.00
BROWN BULLHEAD (C)		1	С	Т	1	1.00	0.76	0.34	0.43	338.00
WHITE CRAPPIE (C)	S	1	C		1	0.83	0.64	0.05	0.07	62.00
ROCK BASS (A)	S	С	С		2	2.00	1.52	0.37	0.47	182.50
GREEN SUNFISH (C)	S	1	C	Т	1	1.00	0.76	0.04	0.05	43.00
BLUEGILL SUNFISH (C)	S	1	C	P	1	1.00	0.76	0.03	0.04	31.00
PUMPKINSEED SUNFISH (C)	S	1	C	Р	2	1.83	1.40	0.11	0.14	58.00
YELLOW PERCH (C)			M		2	1.67	1.27	0.03	0.04	19.00
SAUGER X WALLEYE (C)	Ε	P			1	0.83	0.64	0.77	0.98	924.00
٨	Aile To	tal			144	131.17		78.31		
	lumbe		Speci	es	19		10			
	lumbe				2					

	1	1 4 6 0
River Code: 17-500	Stream: Tuscarawas River	Sample Date: 1995
River Mile: 78.20	Basin: Muskingum River	Date Range: 06/19/95
Data Source: 01	Time Fished: 2531 sec Drain Area: 580.0 sq mi	Thru: 08/24/95
Purpose:	Dist Fished: 1.00 km No of Passes: 2	Sampler Type: A

Species Name / Stage / ODNR Status		Feed Guild			# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
SILVER REDHORSE (C)	R	1	S	М	1	1.00	0.77	0.52	0.68	515.00
NORTHERN HOG SUCKER (C)	R	1	S	M	42	42.00	32.31	6.00	7.90	142.79
WHITE SUCKER (C)	W	0	S	Т	21	21.00	16.15	2.10	2.77	100.00
COMMON CARP (C)	G	0	М	Т	33	33.00	25.38	64.16	84.53	1,944.16
SUCKERMOUTH MINNOW (C)	Ν	1	S		2	2.00	1.54	0.01	0.01	4.00
COMMON SHINER (C)	N	1	S		3	3.00	2.31	0.04	0.05	12.00
SPOTFIN SHINER (C)	N	1	M		4	4.00	3.08	0.06	0.08	14.38
SAND SHINER (C)	Ν	-1	M	M	2	2.00	1.54	0.01	0.01	3.00
BLUNTNOSE MINNOW (C)	Ν	0	С	Т	5	5.00	3.85	0.03	0.04	5.60
CENTRAL STONEROLLER (C)	Ν	Н	N		2	2.00	1.54	0.01	0.02	6.00
COM. CARP X GOLDFISH (C)	G	0		Т	1	1.00	0.77	0.73	0.96	725.00
ROCK BASS (A)	S	C	C		7	7.00	5.38	1.02	1.34	145.57
SMALLMOUTH BASS (A)	F	C	C	M	4	4.00	3.08	1.18	1.55	294.00
LARGEMOUTH BASS (A)	F	C	C		1	1.00	0.77	0.05	0.07	54.00
GREENSIDE DARTER (C)	D	1	S	M	2	2.00	1.54	0.01	0.01	5.50
N	Aile To	tal			130	130.00		75.90		
٨	lumbe	r of S	Speci	es	14					
Λ	lumbei	r of F	lybri	ds	1					

River Code: 17-500 River Mile: 73.40 Data Source: 01

Purpose:

Stream: Tuscarawas River Basin: Muskingum River

Time Fished: 2831 sec

Drain Area: 586.0 sq mi Dist Fished: 1.00 km

No of Passes: 2

Sample Date: 1995 Date Range: 06/19/95 Thru: 08/24/95

Sampler Type: A

Species Name / Stage / ODNR Status			Bree		# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
BOWFIN (C)		Р	С		1	1.00	0.92	0.24	0.30	240.00
SILVER REDHORSE (C)	R	1	S	M	2	2.00	1.83	0.64	0.80	320.00
GOLDEN REDHORSE (C)	R	1	S	M	. 1	1.00	0.92	0.17	0.21	168.00
NORTHERN HOG SUCKER (C)	R	1	S	M	1	1.00	0.92	0.01	0.02	13.00
WHITE SUCKER (C)	W	0	S	Т	5	5.00	4.59	1.33	1.66	265.60
COMMON CARP (C)	G	0	M	Т	54	54.00	49.54	72.06	90.08	1,334.53
GOLDFISH (C)	G	0	M	T	2	2.00	1.83	0.19	0.24	95.00
SPOTFIN SHINER (C)	N	1	M		7	7.00	6.42	0.05	0.07	7.57
BLUNTNOSE MINNOW (C)	Ν	0	C	Т	1	1.00	0.92	0.01	0.01	6.00
COM. CARP X GOLDFISH (C)	G	0		Т	2	2.00	1.83	1.20	1.50	599.00
SMALLMOUTH BASS (A)	F	C	С	M	5	5.00	4.59	1.47	1.84	294.20
LARGEMOUTH BASS (A)	F	C	C		2	2.00	1.83	1.56	1.95	781.50
WARMOUTH SF (C)	S	С	C		2	2.00	1.83	0.06	0.08	31.00
GREEN SUNFISH (C)	S	1	C	Т	1	1.00	0.92	0.03	0.03	27.00
BLUEGILL SUNFISH (C)	S	1	C	P	19	19.00	17.43	0.78	0.97	40.99
B'GILL X PUMPKINSEED (C)					1	1.00	0.92	0.06	0.07	58.00
YELLOW PERCH (C)			M		3	3.00	2.75	0.14	0.17	45.67
	Mile To	tal			109	109.00		80.00		
^	Vumbe	r of S	Speci	es	15					
	Vumbe		7.0		2					

River Code: 17-500 Stream: Tuscarawas River Sample Date: 1995
River Mile: 70.80 Basin: Muskingum River Data Source: 01 Time Fished: 2752 sec Drain Area: 1093.0 sq mi Dist Fished: 1.00 km No of Passes: 2 Sampler Type: A

			_		_				,,	
Species Name / Stage / ODNR Status			Bree Guild	1000	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
QUILLBACK CARPSUCKER (C)	С	0	М		1	1.00	0.64	0.96	0.91	962.00
SILVER REDHORSE (C)	R	1	S	M	1	1.00	0.64	0.35	0.33	353.00
NORTHERN HOG SUCKER (C)	R	1	S	M	53	53.00	33.76	9.76	9.24	184.23
WHITE SUCKER (C)	W	0	S	Т	7	7.00	4.46	2.38	2.25	339.29
COMMON CARP (C)	G	0	M	Т	39	39.00	24.84	83.25	78.81	2,134.73
GOLDFISH (C)	G	0	M	T	7	7.00	4.46	0.91	0.86	129.43
SUCKERMOUTH MINNOW (C)	N.	1	S		1	1.00	0.64	0.00	0.00	4.00
SPOTFIN SHINER (C)	Ν	-1	M		4	4.00	2.55	0.04	0.03	9.00
SAND SHINER (C)	N	1	M	M	1	1.00	0.64	0.00	0.00	4.00
BLUNTNOSE MINNOW (C)	Ν	0	C	Т	6	6.00	3.82	0.02	0.02	3.67
COM. CARP X GOLDFISH (C)	G	0		T	1	1.00	0.64	0.42	0.40	418.00
CHANNEL CATFISH (C)	F		С		2	2.00	1.27	1.33	1.26	666.00
YELLOW BULLHEAD (C)		1	C	Т	1	1.00	0.64	0.34	0.33	344.00
WHITE CRAPPIE (C)	S	1	C		1	1.00	0.64	0.06	0.06	64.00
ROCK BASS (A)	S	C	C		3	3.00	1.91	0.73	0.69	241.67
ROCK BASS (B)	S	C	С		4	4.00	2.55	0.15	0.14	36.25
SMALLMOUTH BASS (A)	F	С	C	M	17	17.00	10.83	4.85	4.59	285.29
WARMOUTH SF (C)	S	С	C		1	1.00	0.64	0.02	0.02	21.00
GREEN SUNFISH (C)	S	1	C	T	1	1.00	0.64	0.01	0.01	8.00
BLUEGILL SUNFISH (C)	S	1	C	P	2	2.00	1.27	0.02	0.02	9.00
YELLOW PERCH (C)			M		1	1.00	0.64	0.03	0.03	28.00
GREENSIDE DARTER (C)	D	1	S	M	2	2.00	1.27	0.01	0.01	3.00
BANDED DARTER (C)	D	1	S	1	1	1.00	0.64	0.00	0.00	2.00
M	lile To	tal			157	157.00		105.64		
	umbe		Speci	es	21	207.00		103.04		
	umbe				1					
				700551	-					

River Code: 17-500
River Mile: 68.70
Data Source: 01
Purpose:

Stream: Tuscarawas River
Basin: Muskingum River
Time Fished: 2572 sec Drain Area: 1103.0 sq mi
Dist Fished: 1.00 km No of Passes: 2

Sample Date: 1995
Date Range: 06/20/95
Thru: 08/25/95
Sampler Type: A

				-	1011/2/8001	ACTOR AND INCOME.	1000	30 V	71	3000-177
Species Name / Stage / ODNR Status		Feed Guild		200	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
QUILLBACK CARPSUCKER (C)	С	0	М		1	1.00	0.42	0.94	0.66	936.00
SILVER REDHORSE (C)	R	1	S	M	1	1.00	0.42	0.03	0.02	31.00
GOLDEN REDHORSE (C)	R	1	S	M	3	3.00	1.26	0.36	0.25	119.33
NORTHERN HOG SUCKER (C)	R	1	S	M	89	89.00	37.39	16.96	12.04	190.54
WHITE SUCKER (C)	W	0	S	Т	8	8.00	3.36	3.31	2.35	414.00
COMMON CARP (C)	G	0	M	Т	54	54.00	22.69	110.81	78.67	2,051.95
GOLDFISH (C)	G	0	M	Т	1	1.00	0.42	0.14	0.10	136.00
RIVER CHUB (C)	Ν	1	N	1	8	8.00	3.36	0.51	0.36	64.23
SPOTFIN SHINER (C)	Ν	1	М		18	18.00	7.56	0.13	0.09	7.09
SAND SHINER (C)	Ν	1	М	M	1	1.00	0.42	0.00	0.00	3.00
BLUNTNOSE MINNOW (C)	Ν	0	С	T	11	11.00	4.62	0.05	0.04	4.73
CHANNEL CATFISH (C)	F		C		1	1.00	0.42	0.63	0.45	634.00
YELLOW BULLHEAD (C)		-1	C	T .	1	1.00	0.42	0.34	0.24	339.00
BROWN BULLHEAD (C)		1	C	Т	1	1.00	0.42	0.24	0.17	242.00
WHITE CRAPPIE (C)	S	1	С		. 1	1.00	0.42	0.04	0.03	43.00
ROCK BASS (A)	S	C	C		8	8.00	3.36	1.10	0.78	138.00
ROCK BASS (B)	S	С	С		5	5.00	2.10	0.18	0.13	36.20
SMALLMOUTH BASS (A)	F	C	C	M	14	14.00	5.88	4.89	3.47	349.29
LARGEMOUTH BASS (A)	F	C	C		1	1.00	0.42	0.03	0.02	28.00
GREEN SUNFISH (C)	S	1	C	Т	2	2.00	0.84	0.01	0.01	5.00
BLUEGILL SUNFISH (C)	S	1	С	Р	1	1.00	0.42	0.04	0.03	41.00
PUMPKINSEED SUNFISH (C)	S	1	С	Р	1	1.00	0.42	0.01	0.01	12.00
YELLOW PERCH (C)			M		2	2.00	0.84	0.08	0.06	40.50
GREENSIDE DARTER (C)	D	1	S	M	4	4.00	1.68	0.02	0.01	3.75
BANDED DARTER (C)	D	1	S	1	1	1.00	0.42	0.00	0.00	2.00
٨	Aile To	tal			238	238.00		140.85		
	lumbe		Speci	ies	24	20.00		170.03		
	lumbe				0			ä		
,			,		~					

River Code: 17-500	Stream: Tuscarawas River	Sample Date: 1995
River Mile: 64.10	Basin: Muskingum River	Date Range: 06/20/95
Data Source: 01	Time Fished: 3353 sec Drain Area: 1403.0 sq mi	Thru: 08/25/95
Purpose:	Dist Fished: 1.00 km No of Passes: 2	Sampler Type: A

Species Name / Stage / ODNR Status		Feed Guild		(# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
QUILLBACK CARPSUCKER (C)	С	0	М		3	3.00	2.26	2.22	1.10	740.67
SILVER REDHORSE (C)	R	1	S	M	2	2.00	1.50	2.41	1.20	1,202.50
GOLDEN REDHORSE (C)	R	1	S	M	2	2.00	1.50	1.24	0.61	617.50
NORTHERN HOG SUCKER (C)	R	- 1	S	M	29	29.00	21.80	4.85	2.41	167.16
WHITE SUCKER (C)	W	0	S	T	9	9.00	6.77	3.38	1.68	375.44
COMMON CARP (C)	G	0	M	T	74	74.00	55.64	184.52	91.71	2,493.45
SPOTFIN SHINER (C)	Ν	1	M		3	3.00	2.26	0.03	0.01	8.33
BLUNTNOSE MINNOW (C)	Ν	0	C	T	3	3.00	2.26	0.01	0.00	2.00
COM. CARP X GOLDFISH (C)	G	0		T	1	1.00	0.75	0.32	0.16	320.00
CHANNEL CATFISH (C)	F		C		1	1.00	0.75	0.67	0.33	674.00
ROCK BASS (A)	S	C	C		1	1.00	0.75	0.15	0.08	153.00
SMALLMOUTH BASS (A)	F	C	C	M	1	1.00	0.75	0.49	0.25	493.00
YELLOW PERCH (C)			M		2	2.00	1.50	0.05	0.02	24.50
JOHNNY DARTER (C)	D	1	C		1	1.00	0.75	0.00	0.00	2.00
SAUGER X WALLEYE (C)	Ε	Р			1	1.00	0.75	0.87	0.43	870.00
٨	/lile To	tal			133	133.00		201.20		
٨	lumbe	r of S	Speci	ies	13					
٨	lumbe	r of F	lybri	ds	2					

Appendix Table 5. Index of Biotic Integrity (IBI) metrics and scores and Modified Index of Well-being (MIwb) scores by river mile for locations sampled in the Tuscarawas River study area, 1995.

01/22/96

Appendix Table 5. IBI metrics and scores for the Tuscarawas River, 1995.

					Number of	er of				Percen	Percent of Individuals	iduals			Rel.No.		
River Mile T	Type	Date	Drainage Total Sunfish Sucke area (sq mi) species species species	Total species	Sunfish species	Sucker	Sunfish Sucker Intolerant species species	Rnd-bodied suckers	Simple Lithophils	Tolerant fishes	Omni- vores	Top	Insect- ivores	DELT	tolerants /(1.0 km)	B	Modified Iwb
Tuscarawas River - (17-500)	iver-	. (17-500)												5			
Year: 95																	
81.40) V	81.40 A 06-19-95	547	11(3)	2(3)	3(3)	0(1)	18(1)	42(3)	70(1)	67(1)	4(1)	28(3)	2.5(3)	40(1) *	24	5.1
81.40 A		08/24/95	547	12(3)	4(5)	3(3)	0(1)	21(3)	35(3)	58(1)	60(1)	6(3)	27(3)	17.9(1)	64(1) *	28	5.9
79.80 A		06-19-95	550	14(3)	4(5)	3(3)	0(1)	12(1)	27(3)	70(1)	67(1)	3(1)	24(1)	12.0(1)	* (1)0+	22	5.7
79.80 A		08/24/95	550	8(1)	2(3)	3(3)	0(1)	36(3)	56(5)	53(1)	53(1)	1(1)	42(3)	14.3(1)	60(1) *	24	5.6
78.20 A		06-19-95	580	10(3)	1(1)	2(1)	0(1)	33(3)	54(5)	38(1)	38(1)	11(5)	48(3)	9.8(1)	76(1) *	26	5.9
78.20 A		08/24/95	580	9(1)	1(1)	3(3)	0(1)	33(3)	55(5)	54(1)	54(1)	7(3)	39(3)	14.7(1)	64(1) *	24	5.4
73.40 A		06-19-95	586	8(1)	2(3)	2(1)	0(1)	4(1)	11(1)	61(1)	(1)	15(5)	24(1)	2.2(3)	36(1) *	20	5.1
73.40 A		08/24/95	286	11(3)	3(3)	3(3)	0(1)	3(1)	(1)9	59(1)	57(1)	5(1)	32(3)	24.6(1)	\$2(1) *	20	4.3
70.80 A		06-20-95	1093	15(3)	4(5)	4(3)	0(1)	28(3)	36(3)	32(1)	33(1)	24(5)	41(3)	1.3(3)	106(1) *	32	7.4
70.80 A		08/25/95	1093	10(3)	3(3)	2(1)	1(1)	41(5)	47(5)	47(1)	44(1)	8(3)	46(3)	22.5(1)	84(1) *	28	5.8
68.70 A	A C	06-20-95	1103	10(3)	1(1)	2(1)	1(1)	43(5)	46(5)	36(1)	35(1)	10(3)	56(5)	3.5(1)	* 104(1)	28	5.9
02.89	0 Y	68.70 A 08/25/95	1103	20(3)	5(5)	5(3)	2(3)	37(3)	44(5)	31(1)	30(1)	13(5)	55(5)	10.9(1)	216(3)	38	7.7
64.10	0 V	64.10 A 06-20-95	1403	6(1)	0(1)	4(3)	0(1)	8(1)	17(1)	85(1)	90(1)	0(1)	10(1)	17.7(1)	16(1) *	14	3.8
64.10	0 Y	64.10 A 08/25/95	1403	11(3)	1(1)	4(3)	0(1)	36(3)	41(3)	53(1)	53(1)	4(1)	40(3)	31.9(1)	76(1) *	22	5.5